



Microscope Components for Reflected Light Applications



CFI60-2 CFI60 CFI&IC



Select a Nikon microscope unit for your manufacturing equipment and other systems that require high precision

The development, manufacture, and evaluation of products require sub-micron precision,
as symbolized by semiconductor manufacturing technology.

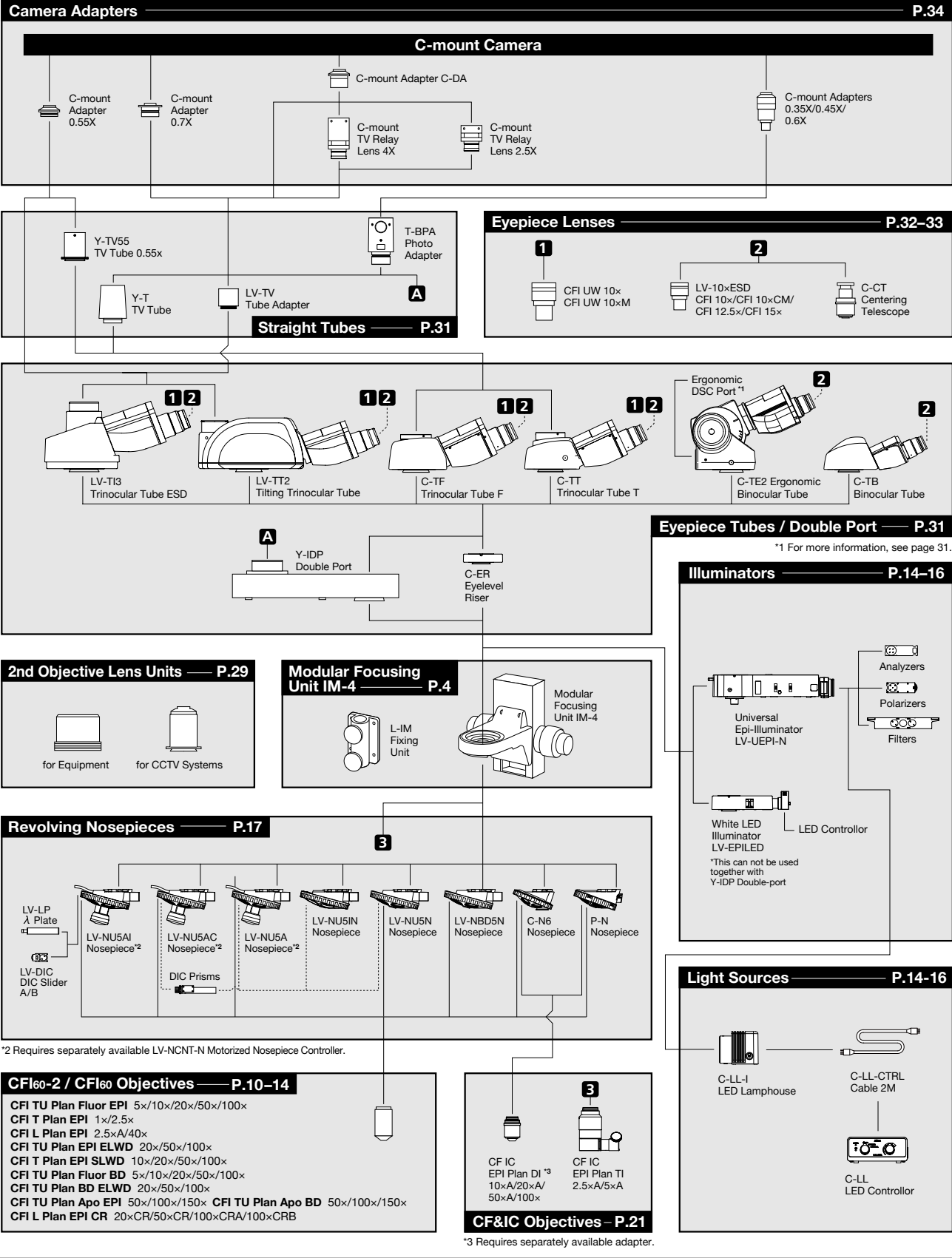
Nikon's microscope units support such high precision and can be integrated with a variety of equipment.

This brochure presents technical data on using Nikon's microscope units.

Contents			
L-IM Modular Focusing Unit	4	Objectives for Measuring Microscopes	24
LV-IM IM Modules	6	Built-in Type Compact Microscopes CM2	25-26
LV-FM FM Modules	7	MR-5 Manual Nosepiece	26
LVDIA-N DIA Base N	8	Ultra Violet/Near-ultraviolet Objective Lenses	27
LV-ARM Basic Arm	9	Ultraviolet Secondary Objective (Lens for Laser)	27
LV-ECON E Controller	9	Optical Lens Barrel for Lasers NLB-4	28
CFI60-2 / CFI60 Objectives	10-14	2nd Objective Lens Units	29
LV-UEPI-N Universal Epi-Illuminator	14	Filters	30
LV-UEPI2 Universal Epi-Illuminator 2	15	Eyepiece Tubes	31
LV-UEPI2A Motorized Universal Epi-Illuminator 2	15	Double Port	31
C-LL LED Controller	16	Straight Tubes	31
LV-EPILED White LED Illuminator	16	Eyepiece Lenses	32-33
Revolving Nosepieces	17	Digital Camera Adapters	34
CF&IC Objectives	18-21	Glossary	35
Compact Reflected Microscopes CM Series	22-24		

CFI60-2 IM CFI60-2/CFI60 Optical System (for modular focusing unit)

System Diagram & Index

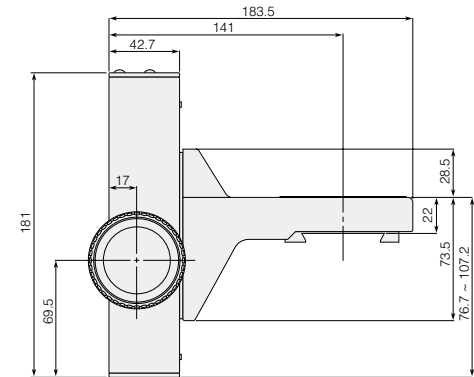
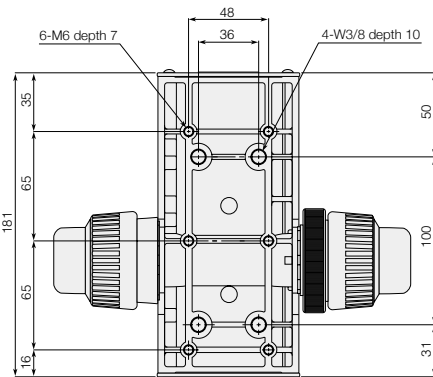
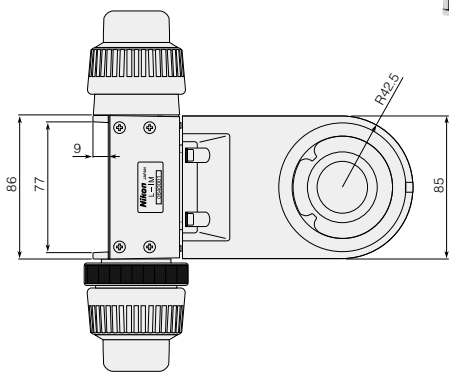
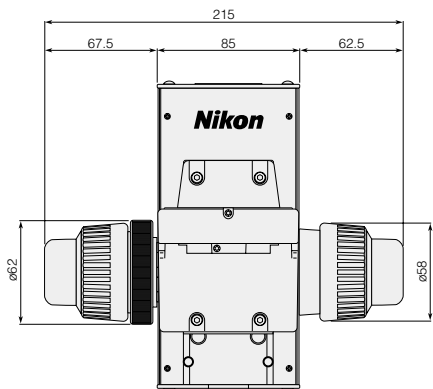


L-IM Modular Focusing Unit (IM-4)

Accommodates an epi-illuminator and motorized nosepiece or a maximum load of 10 kg by adding a balancer.
Accommodates the LV-UEPI-N or LV-EPILED universal illuminator as well as a motorized nosepiece.

- Attachment of the LV-UEPI-N Universal Epi-illuminator enables the use of brightfield, darkfield and Nomarski DIC techniques.
- The built-in balancer ensures smoother vertical motion, even when the arm is heavily loaded.
- The standard maximum load is 4kg, which is expandable to 10 kg by adding a balancer.
- A coarse motion stroke of 5.2 mm per revolution improves the equipment's load handling capability and increases durability.
- The distance from the optical axis to the mounting surface is 141 mm.

Note: For adding a balancer, consult your Nikon representative.



L-IM Modular Focusing Unit
MBD64010 / 2000 g

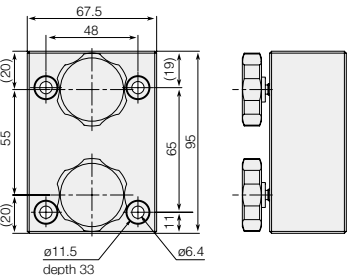
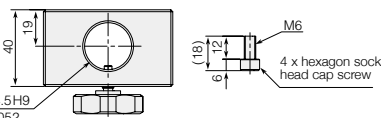
Stroke	30 mm
Coarse focusing	5.2 mm/rotation
Fine focusing	0.1 mm/rotation
Scale	1 μm

Unit: mm

L-IM Adapter for Modular Focusing Unit (Option)

Used to attach the L-IM Modular Focusing Unit to a ø24.5 mm post.

L-IM Adapter for Modular Focusing Unit
MXA23079 / 500 g



Unit: mm

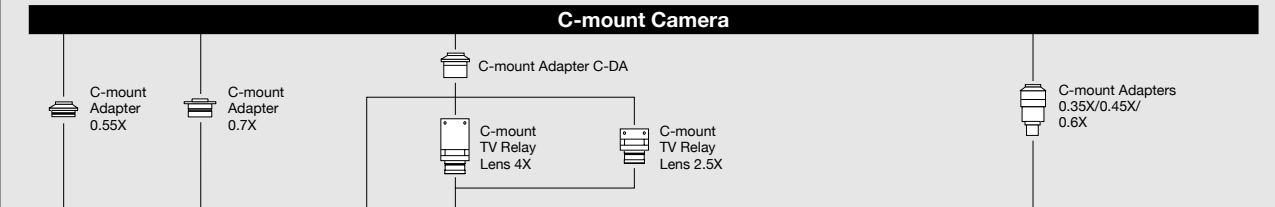
CFI60-2 LV

CFI60-2/CFI60
Optical System
(for LV modules)

System Diagram & Index

Camera Adapters

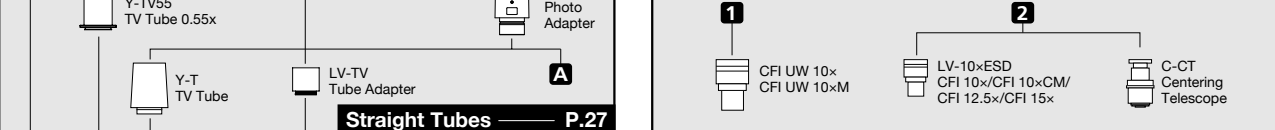
P.34



Y-TV55 TV Tube 0.55x

T-BPA Photo Adapter

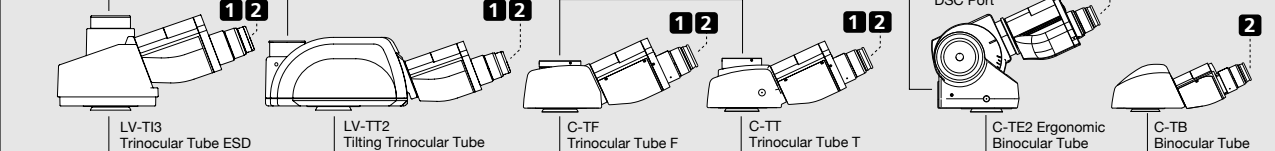
P.32-33



Y-TV Tube

LV-TV Tube Adapter

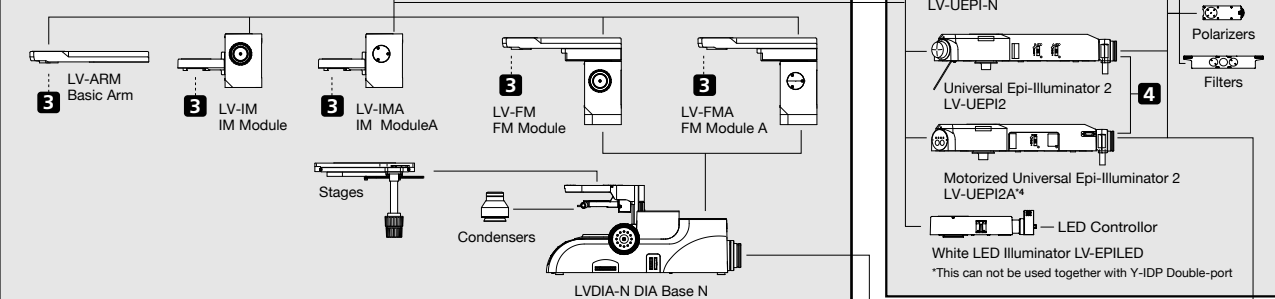
P.27



Y-IDP Double Port

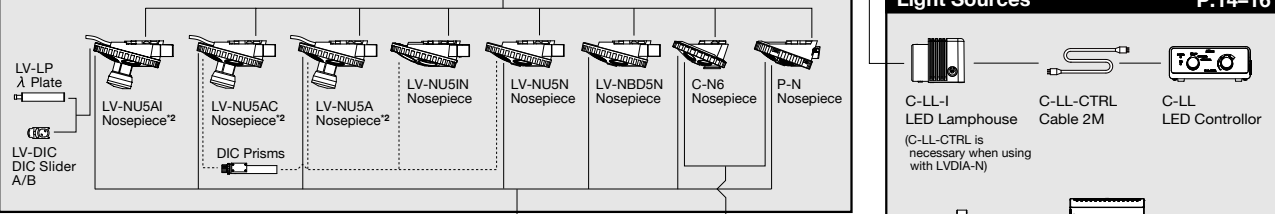
C-ER Eyelevel Riser

P.31



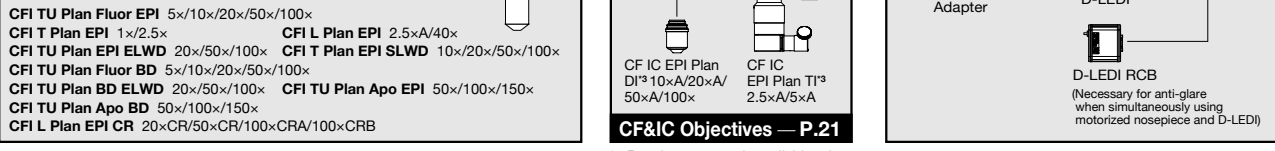
Revolving Nosepieces

P.17



CFI60-2 / CFI60 Objectives

P.10-14



LV-IM IM Modules

This focusing module enables the mounting of a universal illuminator (LV-UEPI-N/LV-UEPI2/LV-UEPI2A or LV-EPILED) and a motorized nosepiece.

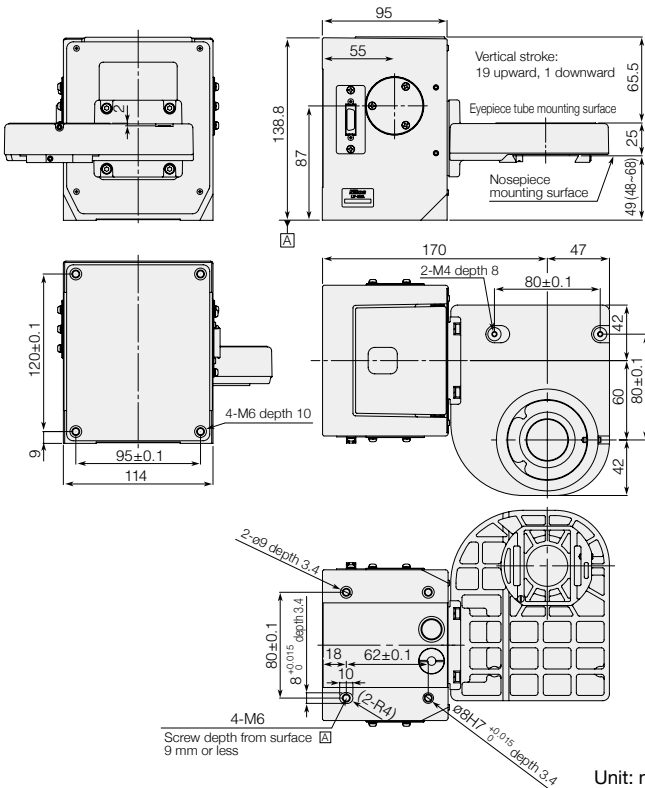
LV-IMA IM Module A (Motorized)

- Selectable mounting surface (back or bottom).
- 20 mm vertical stroke.
- Dramatically improved rigidity enables the mounting of the LV-UEPI2A motorized universal illuminator, etc.
- External control is possible via LV-ECON E Controller.
- The standard maximum permissible weight is 4-7 kg, which is expandable to 10 kg by adding a balancer.



LV-IMA IM Module A (Motorized)
MBD64070 / 4000 g

Vertical stroke	20 mm
Resolution	0.05 μm
Max. speed	2.5 mm/sec (Resolution 0.05 μm)



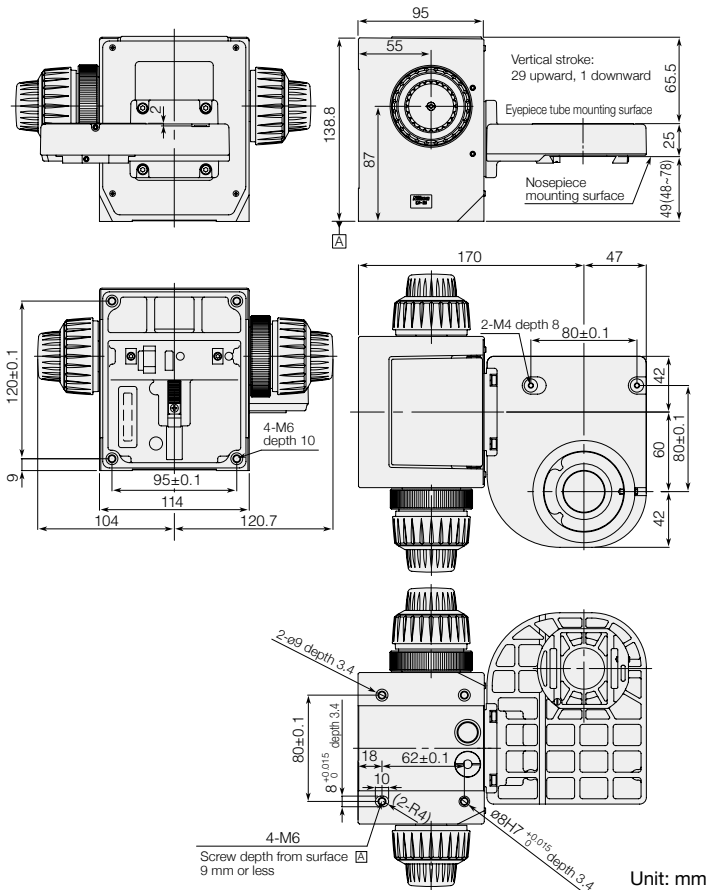
LV-IM IM Module (Manual)

- Selectable mounting surface (back or bottom).
- 30 mm vertical stroke.
- Dramatically improved rigidity enables the mounting of the LV-UEPI2A motorized universal illuminator, etc.
- The standard maximum permissible weight is 4-7 kg, which is expandable to 10 kg by adding a balancer.



LV-IM IM Module (Manual)
MBD64080 / 4000 g

Stroke	30 mm
Coarse focusing	5.2 mm/rotation
Fine Focusing	0.1 mm/rotation
Scale	1 μm



LV-FM FM Modules

LV-FM FM Modules enable mounting of a universal illuminator (LV-UEPI-N/LV-UEPI2/LV-UEPI2A or LV-EPILED) and a motorized nosepiece.

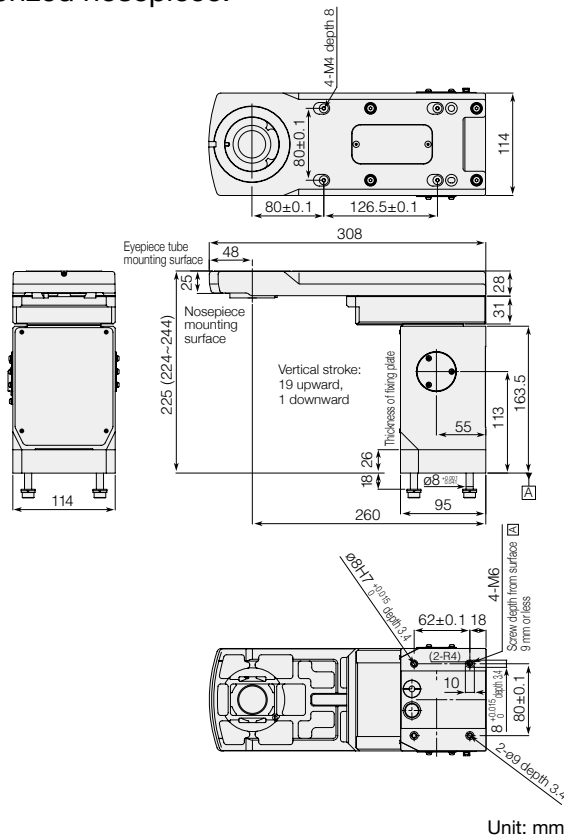
LV-FMA FM Module A (Motorized)

- Only the bottom mounting surface is supported.
- 20 mm vertical stroke.
- Enables an enhanced system with motorized up/down mechanism when combined with the LVDIA-N DIA Base N.
- External control is possible via the LV-ECON E Controller.
- The standard maximum permissible weight is 3-6 kg, which is expandable to 9 kg by adding a balancer.



LV-FMA FM Module A (Motorized)
MBD65040 / 5000 g

Vertical stroke	20 mm
Resolution	0.05 μm
Max. speed	2.5 mm/sec (Resolution 0.05 μm)



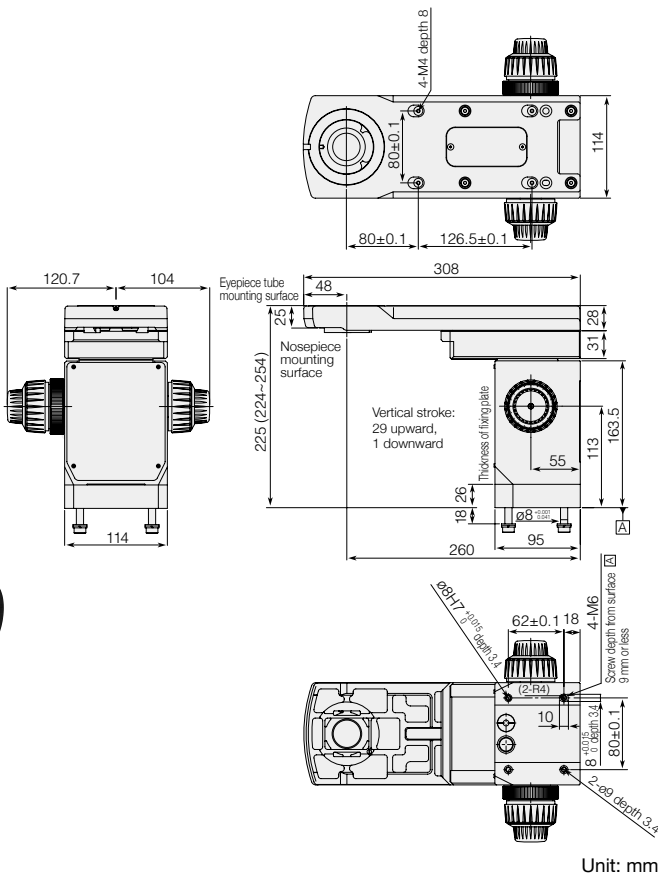
LV-FM FM Module (Manual)

- Only the bottom mounting surface is supported.
- 30 mm vertical stroke.
- Creates a system with revolving up/down mechanism that has an ultra-long vertical stroke of 68 mm when combined with the LVDIA-N DIA Base N.
- Optimal for operations such as semiconductor probe inspections.
- The standard maximum permissible weight is 3-6 kg, which is expandable to 9 kg by adding a balancer.



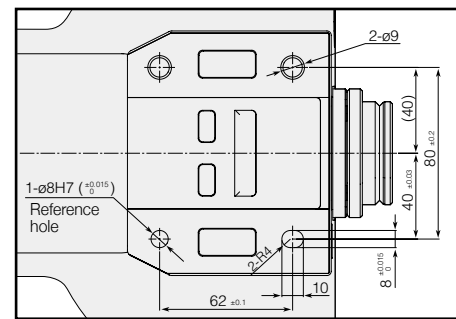
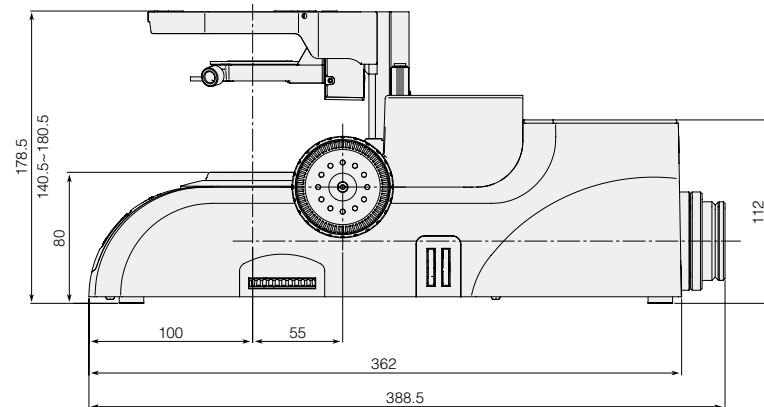
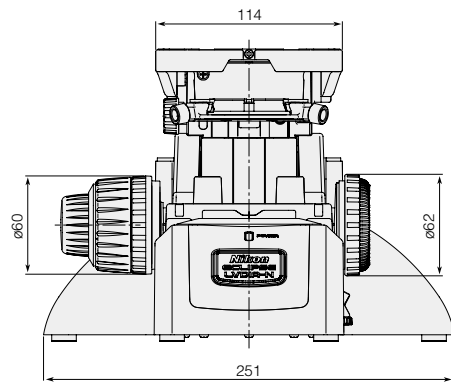
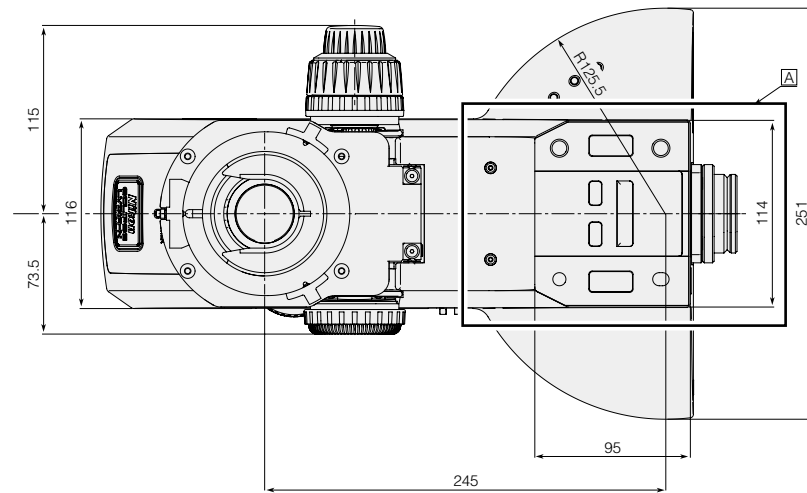
LV-FM FM Module (Manual)
MBD65050 / 5000 g

Stroke	30 mm
Coarse focusing	5.2 mm/rotation
Fine Focusing	0.1 mm/rotation
Scale	1 μm



LVDIA-N DIA Base N

This base unit is for the ECLIPSE LV series of modular microscopes. The attachment of an optional power source enables the incorporation of a transmission illuminator.

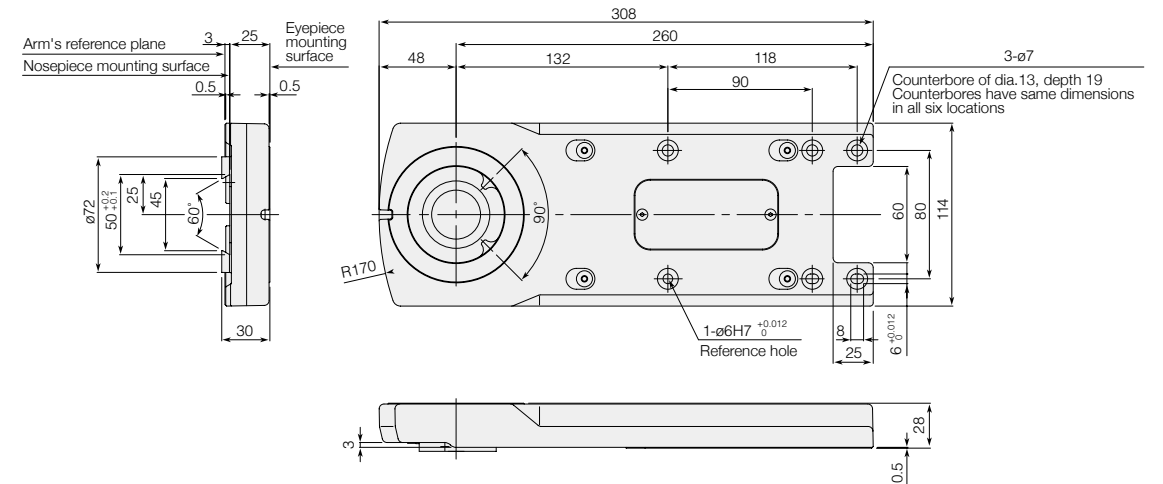
Enlarged view 

LVDIA-N DIA Base N MBD65015 / 5600 g
Unit: mm

Unit: mm

LV-ARM Basic Arm

This arm unit is for the ECLIPSE LV series of modular microscopes.



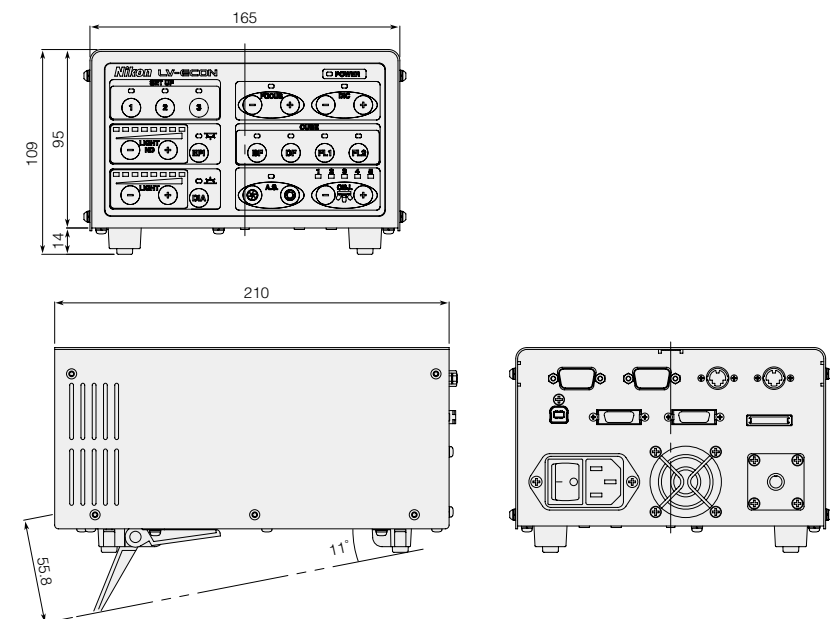
LV-ARM Basic Arm MBD65030 / 1400 g

Unit: mm

LV-ECON E Controller

This controller enables external control of various units from a PC and other devices.

- Enables external control of motorized universal reflection illuminators and various light sources, universal motorized revolvers, and motorized focusing modules from a PC or other devices.
- Communication with PC possible via USB.
- Max. 11° inclination when using tilt (unit's feet).



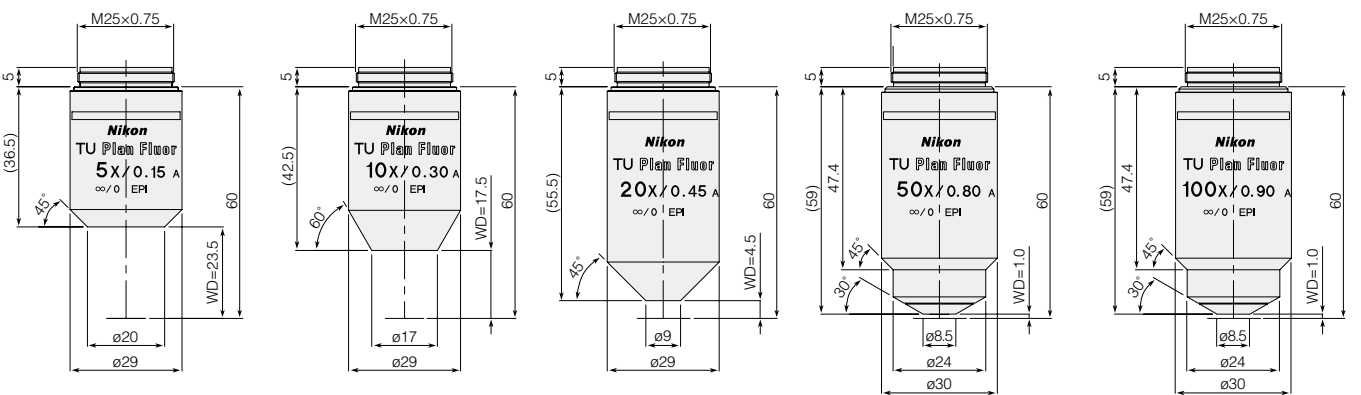
LV-ECON E Controller MBF12200 / 2000 g

Unit: mm

CFI T Plan EPI/CFI TU Plan Fluor EPI/CFI L Plan EPI

Brightfield Objectives

CFI₆₀-2 / CFI₆₀ objectives for brightfield use; Nomarski DIC is also possible with the TU type.



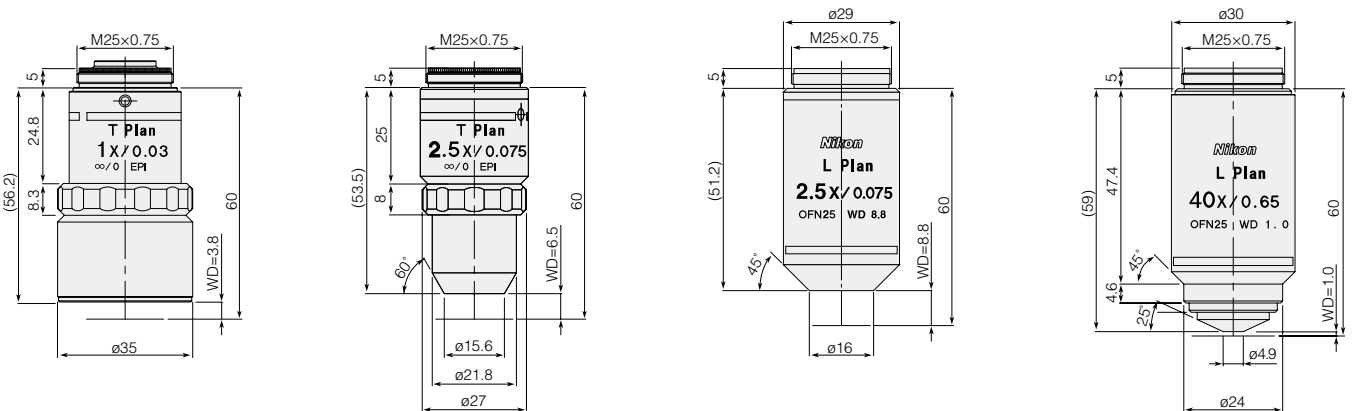
CFI TU Plan Fluor EPI 5x

CFI TU Plan Fluor EPI 10x

CFI TU Plan Fluor EPI 20x

CFI TU Plan Fluor EPI 50x

CFI TU Plan Fluor EPI 100x



CFI T Plan EPI 1x

CFI T Plan EPI 2.5x

CFI L Plan EPI 2.5xA

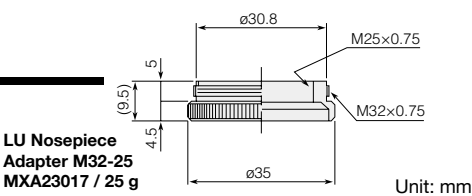
CFI L Plan EPI 40x

Unit: mm

Code No.	CFI ₆₀ -2/CFI ₆₀ Objectives						Widefield CFI eyepieces CFI 10x (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10x (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUE12050	CFI TU Plan Fluor EPI 5x	0.150	23.5	40	12.22	115.0	50x	4.40	31.27	50x	5.000	31.27
MUE12100	CFI TU Plan Fluor EPI 10x	0.300	17.5	20	3.06	120.0	100x	2.20	7.82	100x	2.500	7.82
MUE12200	CFI TU Plan Fluor EPI 20x	0.450	4.5	10	1.36	125.0	200x	1.10	2.95	200x	1.250	2.95
MUE12500	CFI TU Plan Fluor EPI 50x	0.800	1.0	4	0.43	150.0	500x	0.44	0.79	500x	0.500	0.79
MUE12900	CFI TU Plan Fluor EPI 100x	0.900	1.0	2	0.34	150.0	1000x	0.22	0.50	1000x	0.250	0.50
MUE12010	CFI T Plan EPI 1x	0.030	3.8	200	305.56	165.0	10x	22.00	781.75	10x	25.000	781.75
MUE12030	CFI T Plan EPI 2.5x	0.075	6.5	80	48.89	140.0	25x	8.80	125.08	25x	10.000	125.08
MUE00031	CFI L Plan EPI 2.5xA	0.075	8.8	80	48.89	167.5	25x	8.80	125.08	25x	10.000	125.08
MUE00400	CFI L Plan EPI 40x	0.650	1.0	5	0.65	200.0	400x	0.55	0.65	400x	0.625	0.65

LU Nosepiece Adapter M32-25

Adapter for attaching an EPI Plan objective to a brightfield nosepiece or universal nosepiece.



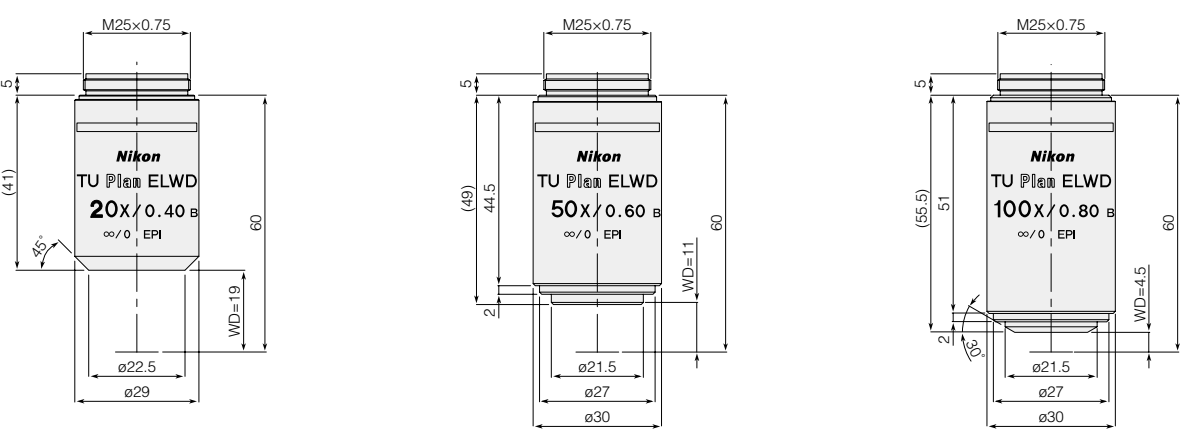
LU Nosepiece Adapter M32-25
MXA23017 / 25 g

Unit: mm

CFI TU Plan EPI ELWD

Long Working Distance Objectives for Brightfield/Nomarski DIC Use

Dramatically extended working distances facilitate observations of samples having irregular surfaces. Working distances have been extended significantly.



CFI TU Plan EPI ELWD 20x

CFI TU Plan EPI ELWD 50x

CFI TU Plan EPI ELWD 100x

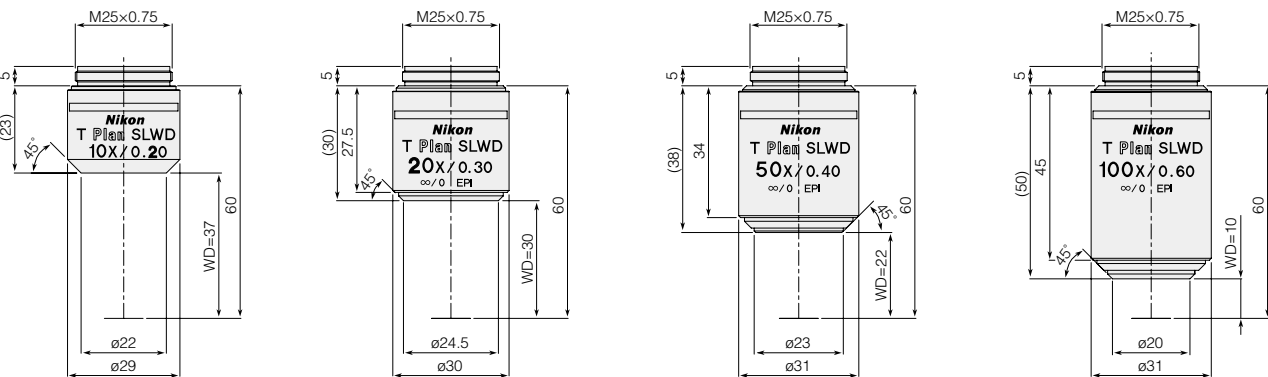
Unit: mm

Code No.	CFI ₆₀ -2/CFI ₆₀ Objectives						Widefield CFI eyepieces CFI 10x (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10x (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUE21200	CFI TU Plan EPI ELWD 20x	0.4	19.0	10	1.72	135	200x	1.10	3.50	200x	1.25	3.50
MUE21500	CFI TU Plan EPI ELWD 50x	0.6	11.0	4	0.76	130	500x	0.44	1.24	500x	0.50	1.24
MUE21900	CFI TU Plan EPI ELWD 100x	0.8	4.5	2	0.43	155	1000x	0.22	0.61	1000x	0.25	0.61

CFI T Plan EPI SLWD

Ultra-long Working Distance Objectives for Brightfield Use

Ultra-long working distances. Particularly useful when observing the bottom of a depression in the sample. Working distances have been extended significantly.



CFI T Plan EPI SLWD 10x

CFI T Plan EPI SLWD 20x

CFI T Plan EPI SLWD 50x

CFI T Plan EPI SLWD 100x

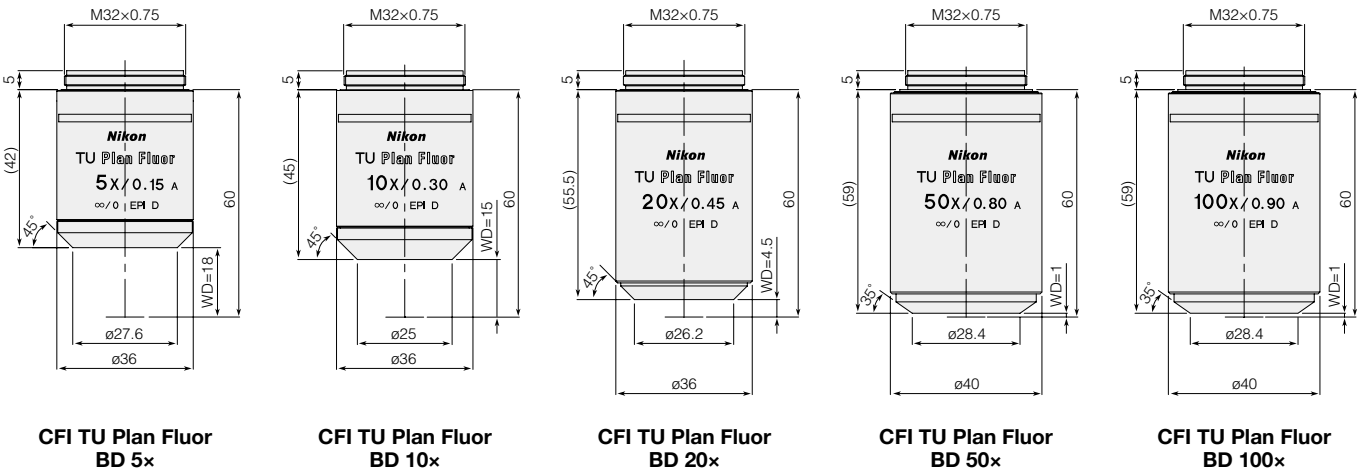
Unit: mm

Code No.	CFI ₆₀ -2/CFI ₆₀ Objectives						Widefield CFI eyepieces CFI 10x (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10x (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUE31100	CFI T Plan EPI SLWD 10x	0.2	37	20	6.88	80	100x	2.20	14.02	100x	2.50	14.02
MUE31200	CFI T Plan EPI SLWD 20x	0.3	30	10	3.06	115	200x	1.10	5.44	200x	1.25	5.44
MUE31500	CFI T Plan EPI SLWD 50x	0.4	22	4	1.72	120	500x	0.44	2.43	500x	0.50	2.43
MUE31900	CFI T Plan EPI SLWD 100x	0.6	10	2	0.76	135	1000x	0.22	1.00	1000x	0.25	1.00

CFI TU Plan Fluor BD

Brightfield/Darkfield/Nomarski DIC Objectives

Perfect for brightfield, darkfield, and Nomarski DIC observations.



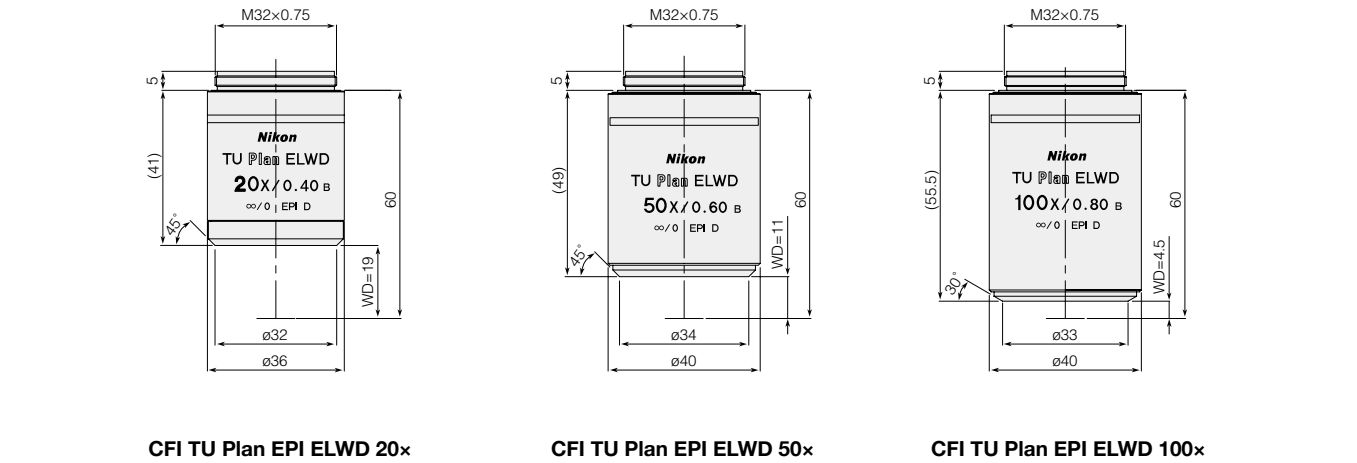
Unit: mm

Code No.	CFI60-2/CFI60 Objectives						Widefield CFI eyepieces CFI 10x (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10x (F.N. 25)		
	Objectives (Magnifications)	NA	WD(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magni- fication (M)	Actual field of view (ømm)	Depth of focus (μm)	Total magni- fication (M)	Actual field of view (ømm)	Depth of focus (μm)
MUE42050	CFI TU Plan Fluor BD 5x	0.15	18.0	40	12.22	150	50x	4.40	31.27	50x	5.00	31.27
MUE42100	CFI TU Plan Fluor BD 10x	0.30	15.0	20	3.06	140	100x	2.20	7.82	100x	2.50	7.82
MUE42200	CFI TU Plan Fluor BD 20x	0.45	4.5	10	1.36	185	200x	1.10	2.95	200x	1.25	2.95
MUE42500	CFI TU Plan Fluor BD 50x	0.80	1.0	4	0.43	200	500x	0.44	0.79	500x	0.50	0.79
MUE42900	CFI TU Plan Fluor BD 100x	0.90	1.0	2	0.34	200	1000x	0.22	0.50	1000x	0.25	0.50

CFI TU Plan BD ELWD

Long Working Distance Objectives
for Brightfield/Darkfield/Nomarski DIC Use

Extended working distances facilitate observations of samples having irregular surfaces.



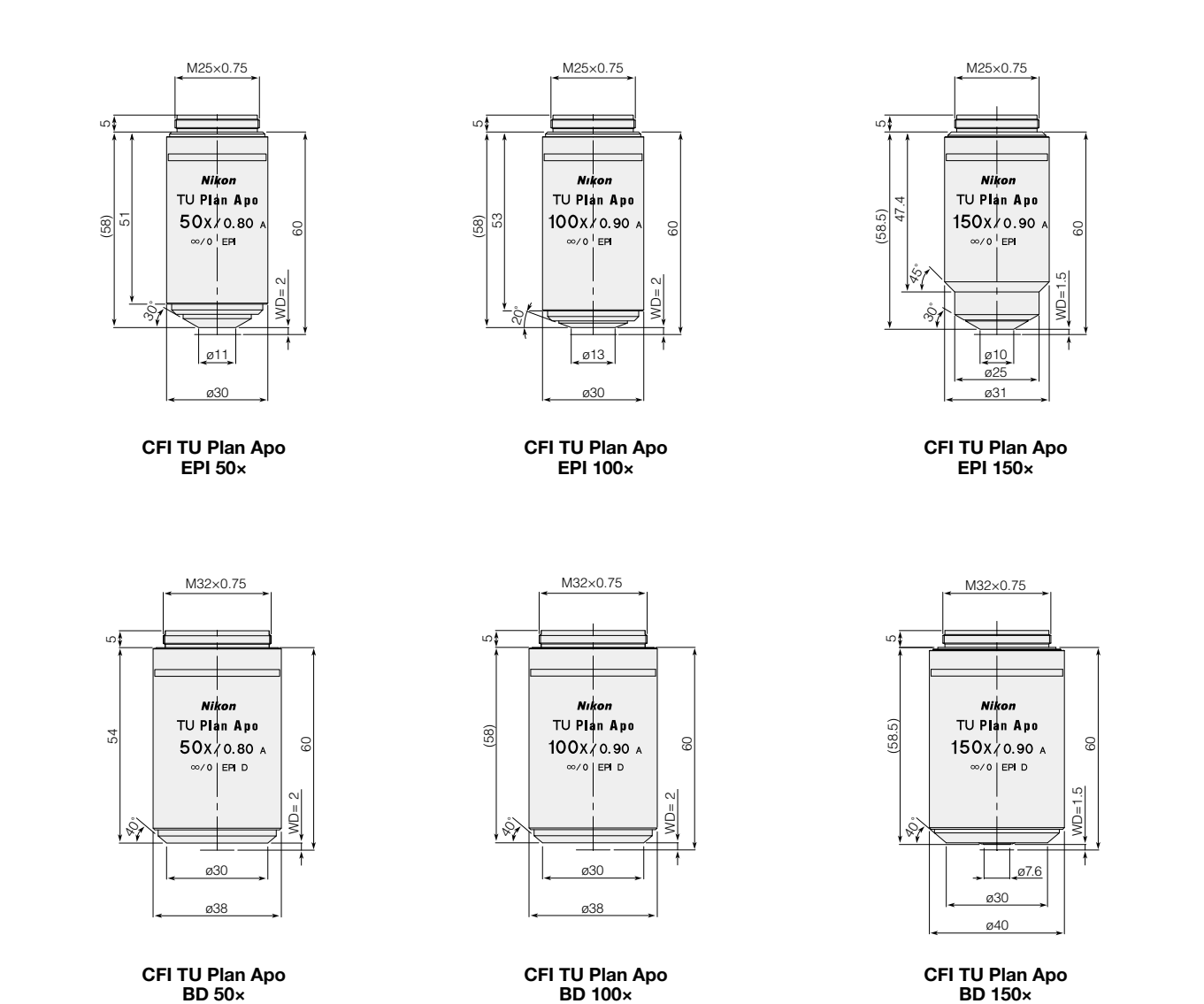
Unit: mm

Code No.	CFI60-2/CFI60 Objectives						Widefield CFI eyepieces CFI 10x (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10x (F.N. 25)		
	Objectives (Magnifications)	NA	WD(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magni- fication (M)	Actual field of view (ømm)	Depth of focus (μm)	Total magni- fication (M)	Actual field of view (ømm)	Depth of focus (μm)
MUE61200	CFI TU Plan BD ELWD 20x	0.4	19.0	10	1.72	155	200x	1.10	3.50	200x	1.25	3.50
MUE61500	CFI TU Plan BD ELWD 50x	0.6	11.0	4	0.76	180	500x	0.44	1.24	500x	0.50	1.24
MUE61900	CFI TU Plan BD ELWD 100x	0.8	4.5	2	0.43	205	1000x	0.22	0.61	1000x	0.25	0.61

CFI TU Plan Apo EPI/CFI TU Plan Apo BD

High-Resolution Objectives for Brightfield or for Darkfield/Brightfield

Apochromat-type objectives virtually eliminate chromatic aberration and feature excellent resolution. Nomarski DIC is also possible with the TU type.



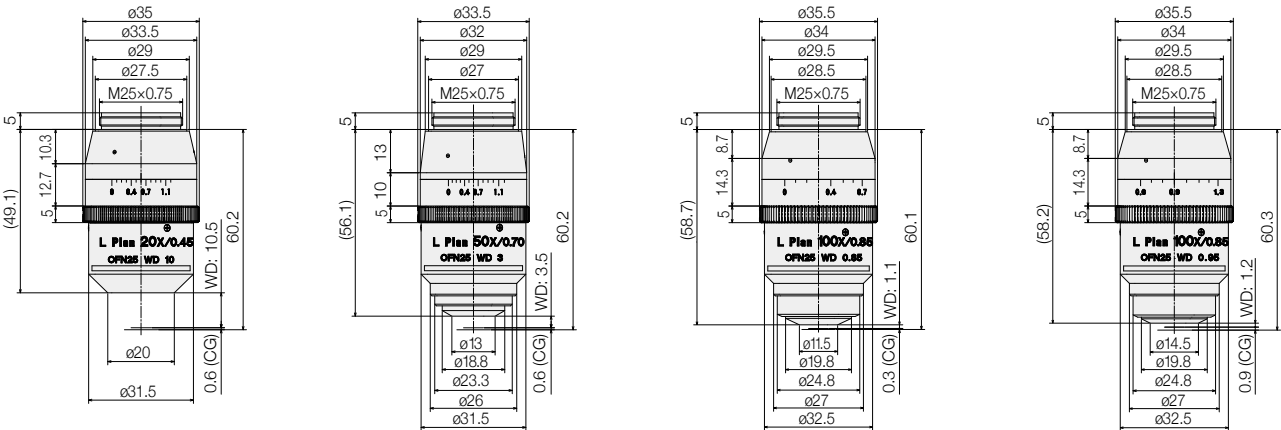
Unit: mm

Code No.	CFI60-2/CFI60 Objectives						Widefield CFI eyepieces CFI 10x (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10x (F.N. 25)		
	Objectives (Magnifications)	NA	WD(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magni- fication (M)	Actual field of view (ømm)	Depth of focus (μm)	Total magni- fication (M)	Actual field of view (ømm)	Depth of focus (μm)
MUC11500	CFI TU Plan Apo EPI 50x	0.80	2.00	4.00	0.43	150.0	500x	0.44	0.79	500x	0.50	0.79
MUC11900	CFI TU Plan Apo EPI 100x	0.90	2.00	2.00	0.34	175.0	1000x	0.22	0.50	1000x	0.25	0.50
MUC11150	CFI TU Plan Apo EPI 150x	0.90	1.50	1.33	0.34	160.0	1500x	0.15	0.45	1500x	0.17	0.45
MUC41500	CFI TU Plan Apo BD 50x	0.80	2.00	4.00	0.43	190.0	500x	0.44	0.79	500x	0.50	0.79
MUC41900	CFI TU Plan Apo BD 100x	0.90	2.00	2.00	0.34	220.0	1000x	0.22	0.50	1000x	0.25	0.50
MUC41150	CFI TU Plan Apo BD 150x	0.90	1.50	1.33	0.34	220.0	1500x	0.15	0.45	1500x	0.17	0.45

CFI L Plan EPI CR

Objectives for LCD Inspection

The CFI L Plan EPI CR series employs a correction system to cope with the thinner coverglass for FDP and the increased integration and mounting density of devices.



CFI L Plan EPI 20xCR CFI L Plan EPI 50xCR CFI L Plan EPI 100xCRA CFI L Plan EPI 100xCRB

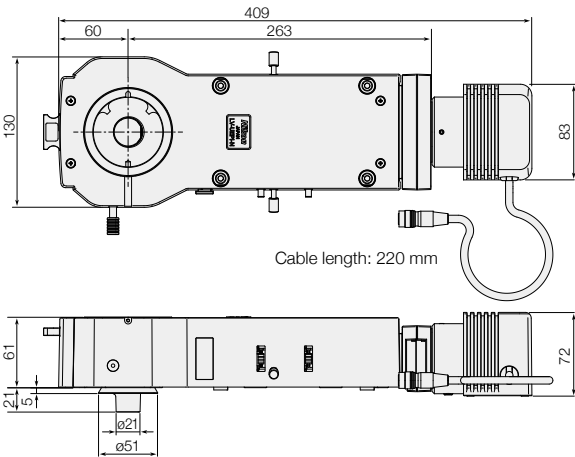
Unit: mm

Code No.	CFI60-2/CFI60 Objectives						Widefield CFI eyepieces CFI 10x (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10x (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUE35200	CFI L Plan EPI 20xCR	0.45	10.9~10.0	10.00	1.36	240	200x	1.10	2.95	200x	1.25	2.95
MUE35500	CFI L Plan EPI 50xCR	0.70	3.9~3.0	4.00	0.56	240	500x	0.44	0.97	500x	0.50	0.97
MUE35900	CFI L Plan EPI 100xCRA	0.85	1.2~0.85	2.00	0.38	260	1000x	0.22	0.55	1000x	0.25	0.55
MUE35910	CFI L Plan EPI 100xCRB	0.85	1.3~0.95	2.00	0.38	260	1000x	0.22	0.55	1000x	0.25	0.55

Universal Epi-Illuminator LV-UEPI-N

This illuminator supports the CFI60-2/CFI60 optical system.

- Enables brightfield, darkfield, simple polarizing, and DIC observation.
- When observation is switched from brightfield to darkfield, the field and aperture diaphragms automatically open.
- When observation is switched back from darkfield to brightfield, the field and aperture diaphragms return to their original positions.
- ESD supported.



Configured with C-LL-I LED Lamphouse

Unit: mm

Universal Epi-Illuminator LV-UEPI-N/MBE60201	
Field diaphragm	Centerable and synchronized with B/D changeover
Aperture diaphragm	Synchronized with B/D changeover
Illumination	C-LL-I high color rendering LED Lamphouse
Filter	ø25 mm filter (LV-C-LCB Color Balance Filter), a polarizer/analyzer
Weight	1,750 g

Code No.	Items	Weight (g)
MBE65900	C-LL-I LED Lamphouse	600
MBN66950	ø25 mm LV-C-LCB Color Balance Filter	30
MBN66923	LV-PO Polarizer	60
MBN66922	L-AN Analyzer	14
MBP60170	L-DIC DIC Slider	120
MBN66730	YM-GIF ø25 mm GIF Filter	25
MEF52300	C-LL LED Controller	120
MXA29016	C-LL-CTRL Extension Cable 2M	100

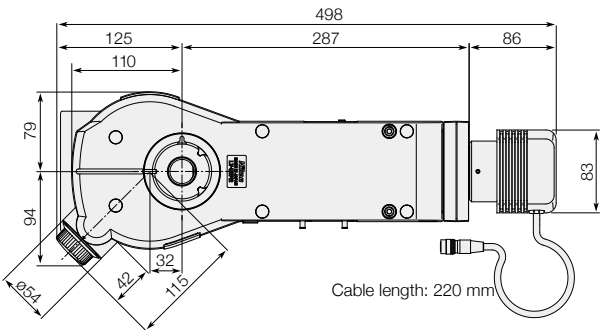
*Cable length: measured from lamphouse to power connector

Universal Epi-Illuminator LV-UEPI2/LV-UEPI2A

These illuminator support the CFI60-2/CFI60 optical system. The LV-UEPI2A is the motorized type.

LV-UEPI2

- Equipped with advanced optics suitable for a wide variety of observation methods, ranging from brightfield, darkfield, simple polarizing, sharp polarizing, and DIC, to epi-Fluorescence.
- Automatically maintains optimal illumination conditions for the field/aperture diaphragms, shutter, and UV cut filters.
- ESD supported.

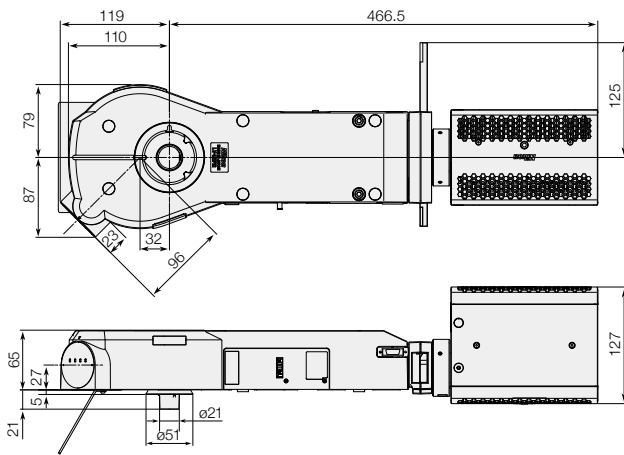


Configured with C-LL-I LED Lamphouse

Unit: mm

LV-UEPI2A

- Accurate reproduction of illumination conditions enabled by the motorization of the changeover turret/aperture diaphragm and the control of the voltage.
- Aperture diaphragm is automatically optimized with the objective lens and illumination technique. Can be changed manually depending on sample and purpose.
- When used with "LV100NDA LED", LV-UEPI2A can be controlled from the microscope's main control unit or a PC.
- External control also possible from a PC when combined with the LV-ECON E Controller.
- ESD supported.



Configured with LVN-D-LEDI D-LEDI Adapter

Unit: mm

Universal Epi-Illuminator LV-UEPI2/MBE60300 Motorized Universal Epi-Illuminator LV-UEPI2A/MBE60310

	LV-UEPI2	LV-UEPI2A
Field diaphragm	Centerable and synchronized with B/D changeover	
Aperture diaphragm	Centerable and synchronized with B/D changeover	Centerable and synchronized with motorized brightfield/darkfield changeover (Automatic optimization according to objective lens)
Illumination	C-LL-I high color rendering LED Lamphouse	Motorized operation/control possible for C-LL-I high color rendering LED lamp illuminator and illumination changeover turret
Filters	ø25 mm filter (LV-C-LCB, ND4, ND16), 2x Fluorescence filter cubes, polarizer/analyzer, λ plate, excitation light balancer	
Weight	2,400 g	2,570 g

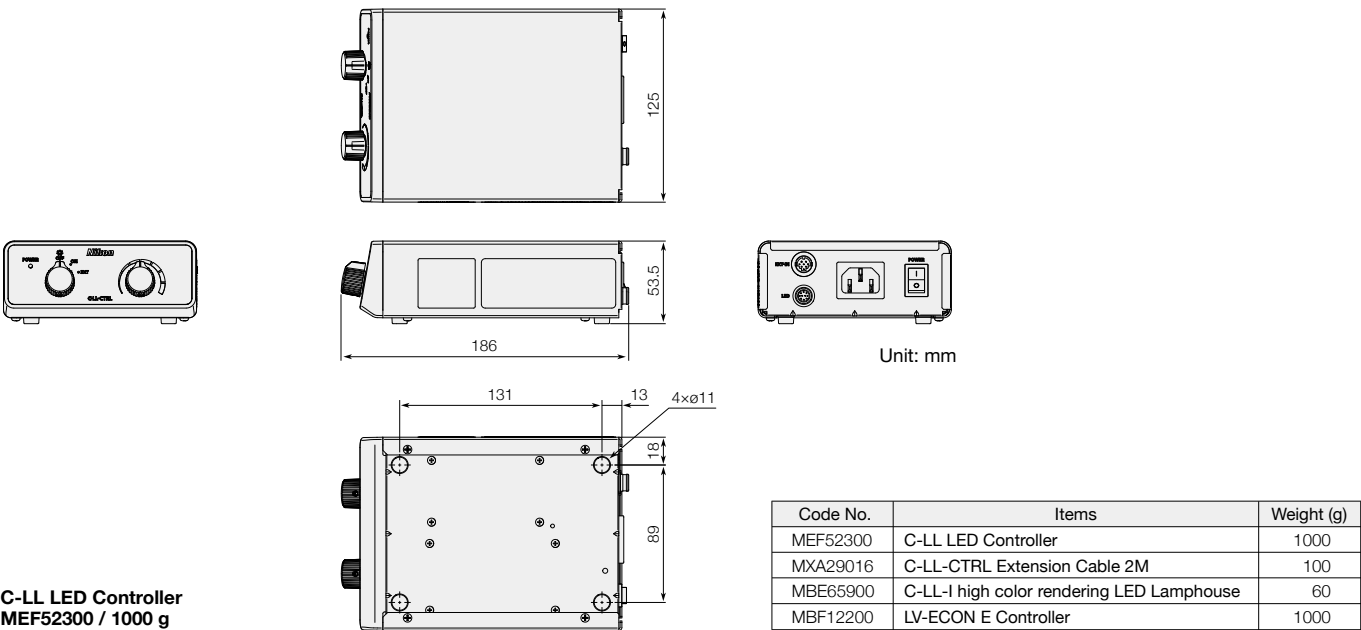
Code No.	Items	Weight (g)
MBE65900	C-LL-I LED Lamphouse	600
MBN66950	ø25 mm LV-C-LCB Color Balance Filter	30
MBN66760	YM-ND ø25 mm Filter Slider ND4/ND16	36
MBN66923	LV-PO Polarizer	60
MBN66925	LV-FLAN FL Analyzer	20
MBN66924	LV-LP λ Plate	15
MBP60170	L-DIC DIC Slider	120
MEF52300	C-LL LED Controller	120
MXA29016	C-LL-CTRL Extension Cable 2M	100

Code No.	Items	Weight (g)
MBF83000	D-LEDI Fluorescence LED Illuminator	2350
MBE65600	LVN-D-LEDI D-LEDI Adapter	185
MBE48001	C-LED385 Filter Cube	39
MBE48021	C-LED470 Filter Cube	39
MBE48041	C-LED525 Filter Cube	39
MBE48061	C-LED625 Filter Cube	39
MBE64100	LV-PAB Polarizer/Analyzer Cube	45
MBN66730	YM-GIF ø25 mm GIF Filter	25

*Cable length: measured from lamphouse to power connector

C-LL LED Controller

This is an external controller for combining the LV-UEPI-N, LV-UEPI2, and LV-UEPI2A universal reflection illuminators with the high color rendering LED light source.



C-LL LED Controller
MEF52300 / 1000 g

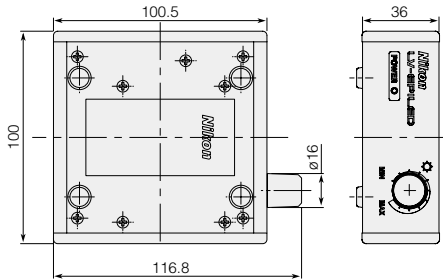
LV-EPILED White LED Illuminator

This LED illuminator supports the CFI60-2 / CFI60 optical system.

- Light-weight, compact white LED illuminator developed specially for brightfield observation.
- Operated via an attached power source controller.
- Can also be externally controlled via the LV-ECON E controller.
- Includes ND4 and ND16 filters.
- Standard cable length : 2.8 m

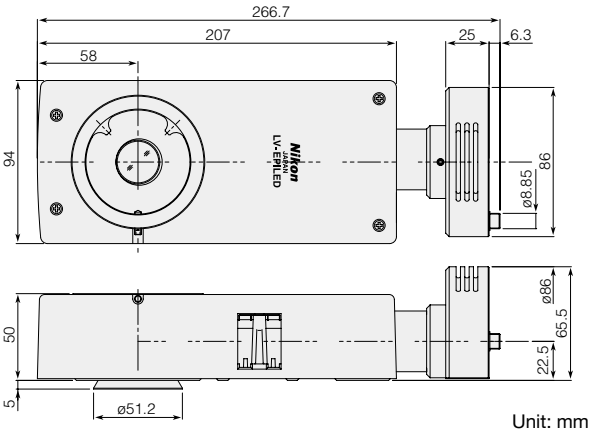


LV-EPILED White LED Illuminator MBE60500 / 1500 g



Controller

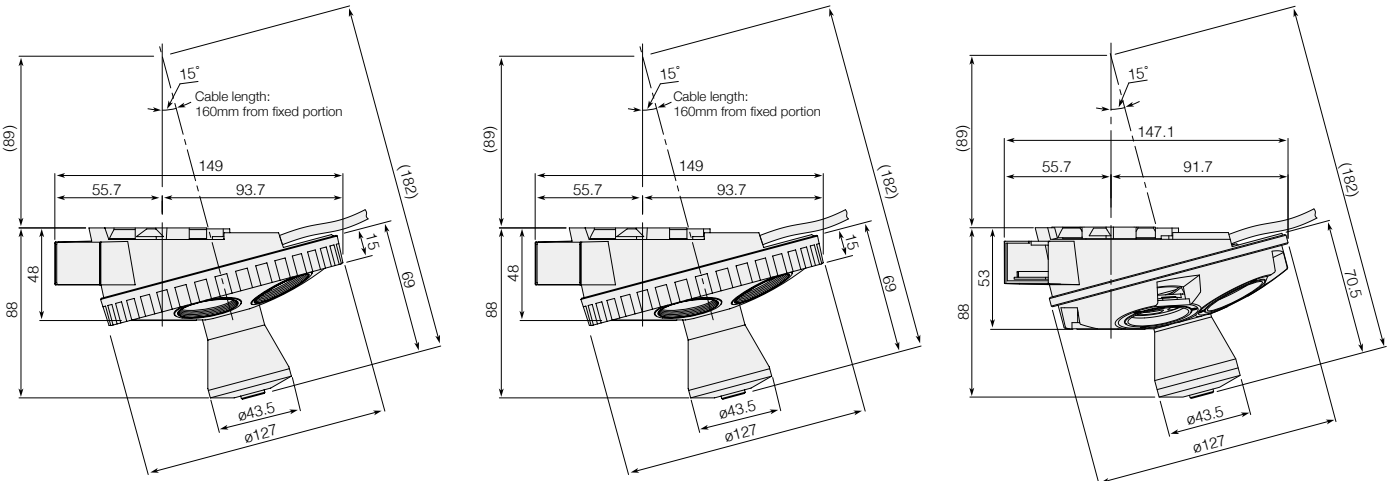
*LV-EPILED is for sale while stock lasts.



Code No.	Items	Weight (g)
MBF11250	Power Cord BJ	160
MQF52056	3-AC AC Adapter	200
MEF51001	TI-100WRC 100W Remote Cable	100

Revolving Nosepieces

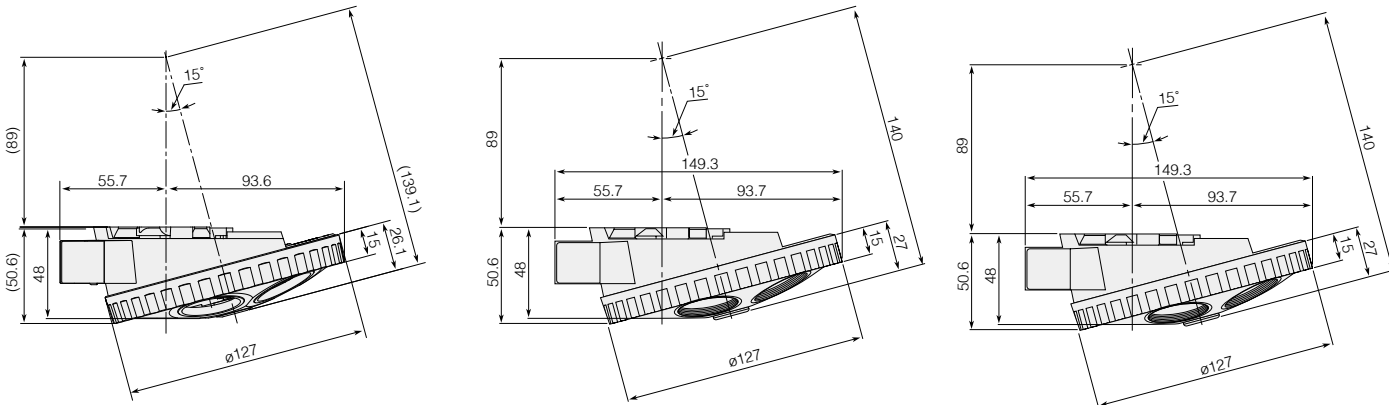
Eight types of nosepieces – either manual or motorized – are available to choose from.



LV-NU5A Nosepiece
MBP60105 / 800 g

LV-NU5AC Nosepiece
MBP60106 / 800 g

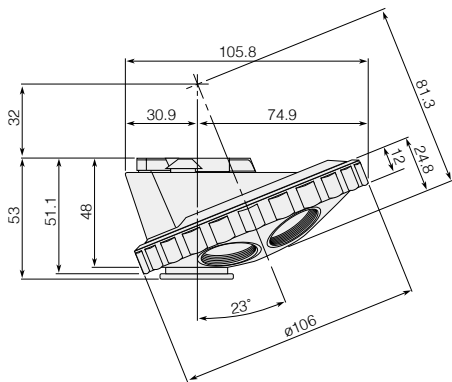
LV-NU5AI Nosepiece
MBP60107 / 890 g



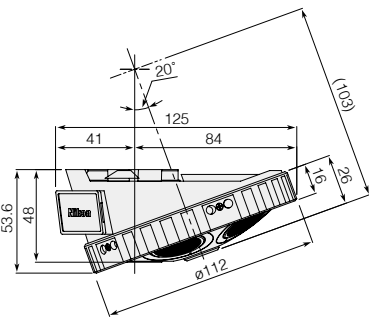
LV-NU5IN Nosepiece
MBP60133 / 600 g

LV-NU5N Nosepiece
MBP60134 / 580 g

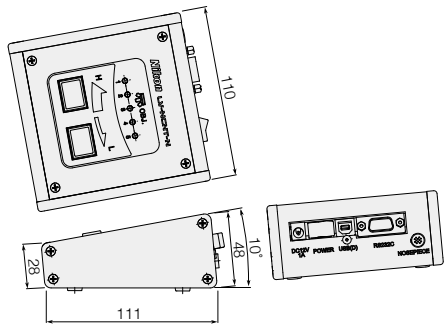
LV-NBD5N Nosepiece
MBP60135 / 580 g



C-N6 Nosepiece
MBP71316 / 450 g



P-N Nosepiece
MDP44205 / 600 g



LV-NCNT-N Motorized Nosepiece Controller
MBF65331 / 400 g
(Standard cable length : 1.5 m)

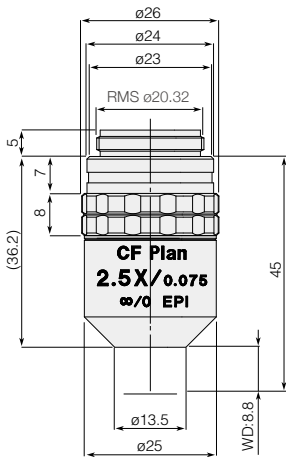
	MBP71316, MDP44205	MBP60133, MBP60134, MBP60135, MBP60105, MBP60106, MBP60107
Thread Diameter	M25 x 0.75 mm	M32 x 0.75 mm

Code No.	Items	Weight (g)
MBF11250	Power Cord BJ	160
MQF52057	AC Adapter	200

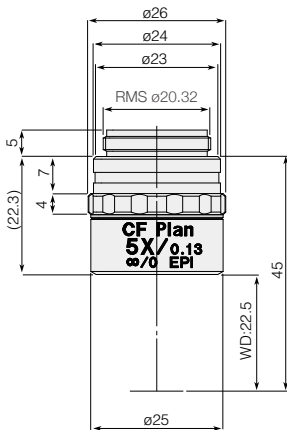
CF IC EPI Plan

Brightfield Objectives

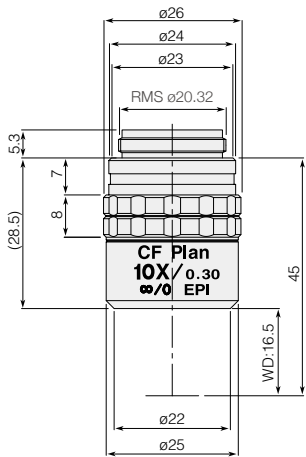
CF&IC objectives for brightfield use.



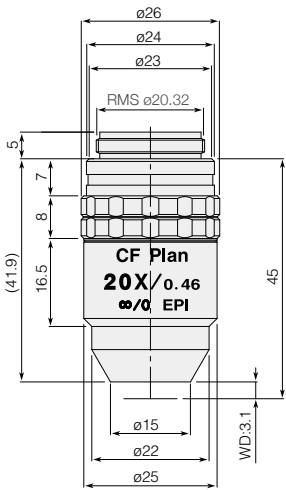
CF IC EPI Plan 2.5xA



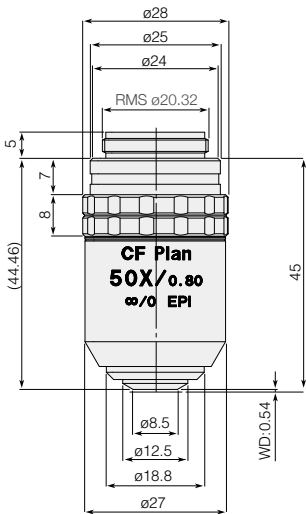
CF IC EPI Plan 5xA



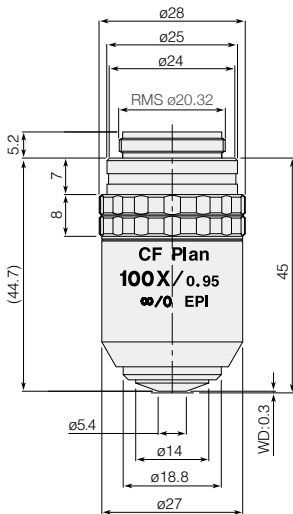
CF IC EPI Plan 10xA



CF IC EPI Plan 20xA



CF IC EPI Plan 50xA



CF IC EPI Plan 100xA

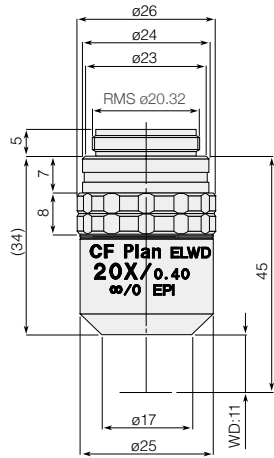
Unit: mm

Code No.	CF IC Objectives						Widefield CF eyepieces CFWN 10x (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10x (F.N. 25)		
	Objectives (Magnifications)	NA	WD(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magni- fication (M)	Actual field of view (mm)	Depth of focus (μm)	Total magni- fication (M)	Actual field of view (mm)	Depth of focus (μm)
MUL00031	CF IC EPI Plan 2.5xA	0.075	8.80	80.00	48.89	108	25×	8.00	125.08	25×	10.00	125.08
MUL00051	CF IC EPI Plan 5xA	0.130	22.50	40.00	16.27	65	50×	4.00	38.25	50×	5.00	38.25
MUL00101	CF IC EPI Plan 10xA	0.300	16.50	20.00	3.06	90	100×	2.00	7.82	100×	2.50	7.82
MUL00201	CF IC EPI Plan 20xA	0.460	3.10	10.00	1.30	120	200×	1.00	2.85	200×	1.25	2.85
MUL00501	CF IC EPI Plan 50xA	0.800	0.54	4.00	0.43	145	500×	0.40	0.79	500×	0.50	0.79
MUL00901	CF IC EPI Plan 100xA	0.950	0.30	2.00	0.30	140	1000×	0.20	0.46	1000×	0.25	0.46

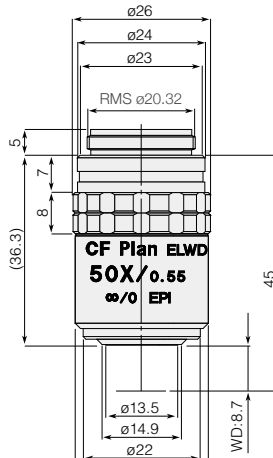
CF IC EPI Plan ELWD

Long Working Distance Objectives for Brightfield Use

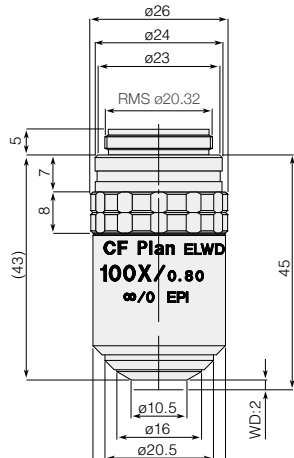
Extended working distances facilitate observations of samples with irregular surfaces.



CF IC EPI Plan ELWD 20xA



CF IC EPI Plan ELWD 50xA



CF IC EPI Plan ELWD 100xA

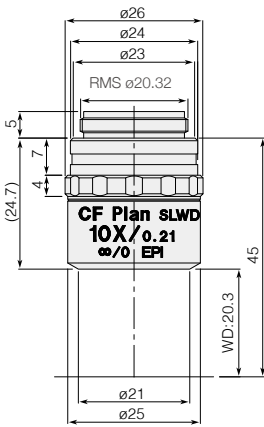
Unit: mm

Code No.	CF IC Objectives						Widefield CF eyepieces CFWN 10x (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10x (F.N. 25)		
	Objectives (Magnifications)	NA	WD(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magni- fication (M)	Actual field of view (mm)	Depth of focus (μm)	Total magni- fication (M)	Actual field of view (mm)	Depth of focus (μm)
MUL03201	CF IC EPI Plan ELWD 20xA	0.40	11.0	10	1.72	95	200×	1.0	3.50	200×	1.25	3.50
MUL03501	CF IC EPI Plan ELWD 50xA	0.55	8.7	4	0.91	105	500×	0.4	1.43	500×	0.50	1.43
MUL03901	CF IC EPI Plan ELWD 100xA	0.80	2.0	2	0.43	120	1000×	0.2	0.61	1000×	0.25	0.61

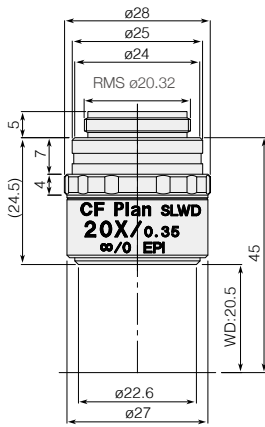
CF IC EPI Plan SLWD

Ultra-long Working Distance Objectives for Brightfield Use

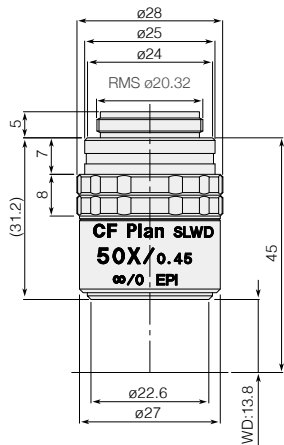
Ultra-long working distances.
Particularly useful when observing the bottom of a depression in the sample.



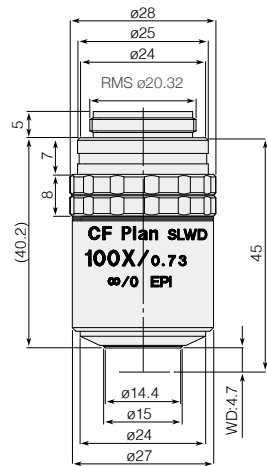
CF IC EPI Plan SLWD 10xA



CF IC EPI Plan SLWD 20xA



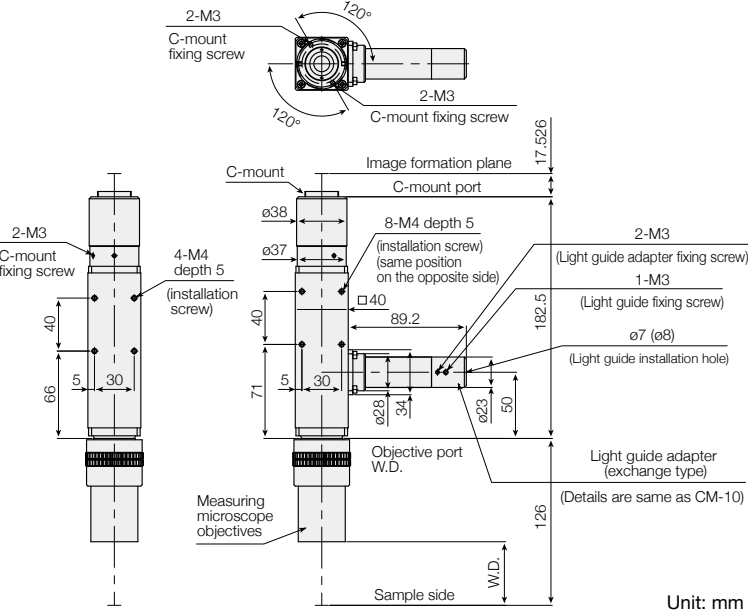
CF IC EPI Plan SLWD 50xA



CF IC EPI Plan SLWD 100xA

Unit: mm

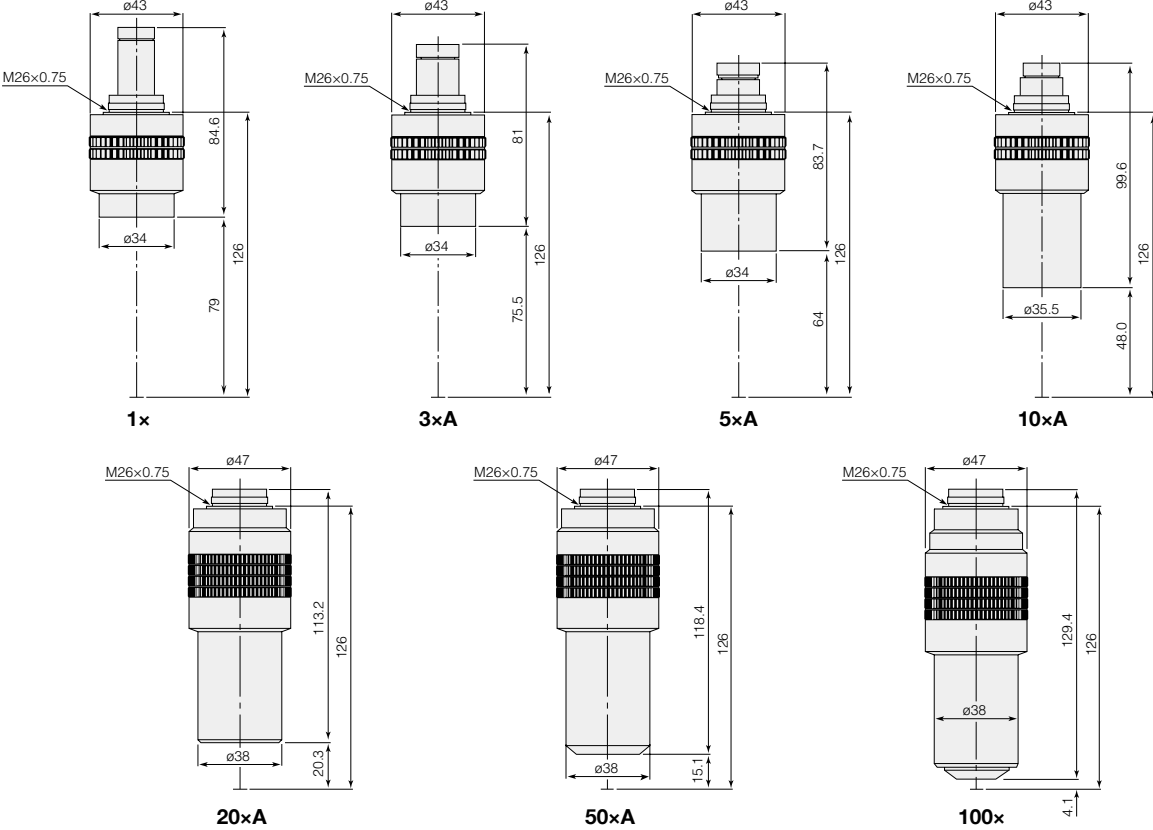
Code No.	CF IC Objectives						Widefield CF eyepieces CFWN 10x (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10x (F.N. 25)		
	Objectives (Magnifications)	NA	WD(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magni- fication (M)	Actual field of view (mm)	Depth of focus (μm)	Total magni- fication (M)	Actual field of view (mm)	Depth of focus (μm)
MUL04101	CF IC EPI Plan SLWD 10xA	0.21	20.3	20	6.24	85	100×	2.0	13.04	100×	2.50	13.04
MUL04201	CF IC EPI Plan SLWD 20xA	0.35	20.5	10	2.24	80	200×	1.0	4.29	200×	1.25	4.29
MUL04501	CF IC EPI Plan SLWD 50xA	0.45	13.8	4	1.36	110	500×	0.4	1.99	500×	0.50	1.99
MUL04901	CF IC EPI Plan SLWD 100xA	0.73	4.7	2	0.52	135	1000×	0.2	0.71	1000×	0.25	0.71



	CM-5A
Camera mount	C-mount
Tube lens focal length	—
Image Size (Diagonal Length)	11 mm
Compatible objectives	Measuring microscope objectives
Illumination optical system	Koehler illumination (high-quality telecentric illumination)
Attachment surfaces	3
Dimensions (W×D×H)	40 × 40 × 186.5 mm
Weight (Approx.)	410 g

Manufactured by: Nikon Engineering Co., Ltd.

Objectives for Measuring Microscopes



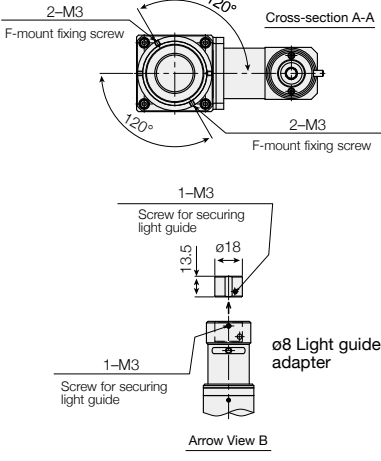
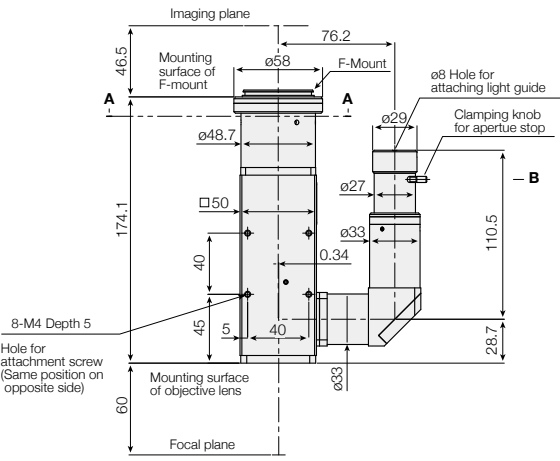
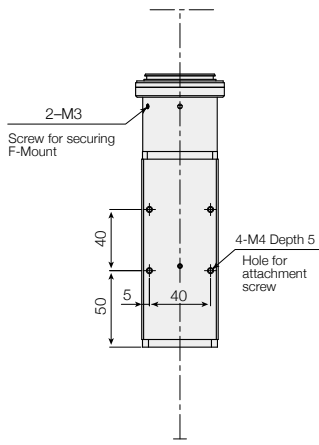
	1x	3x	5x	10x	20x	50x	100x
Focal length (mm)	158.2	66.2	42.3	20.2	10.98	4.3	2.15
NA	0.03	0.09	0.13	0.2	0.4	0.55	0.75
WD (mm)	79	75.5	64	48	20.3	15.1	4.1
Depth of focus (μm)	322	36	17	7	1.8	1	0.5
Parfocal distance (mm)	126						
Weight (g)	120	150	150	200	650	600	550

Built-in Type Compact Microscope CM2 F-mount

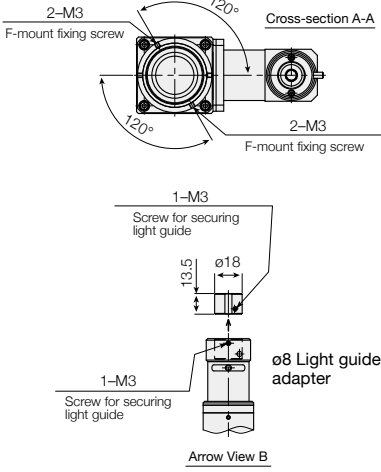
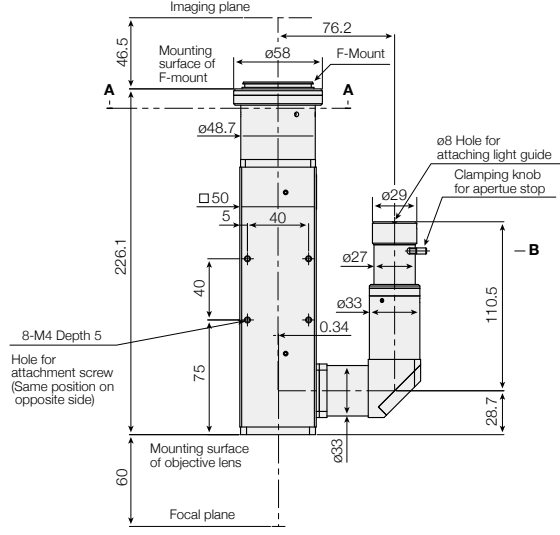
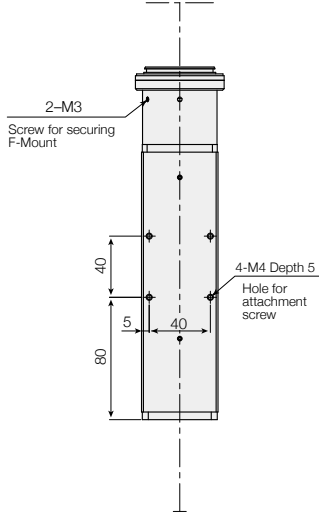
Microscope component compatible with large image sensors.

- Image circle of $\varnothing 25$ mm and $\varnothing 44$ mm.
- F-mount industrial cameras can be directly connected.
- Uniform and bright illumination achieved with Köhler illumination.
- Mounting direction can be selected by utilizing the multiple thread holes.

CM2-F10 EXA60010



CM2-F175 EXA60011



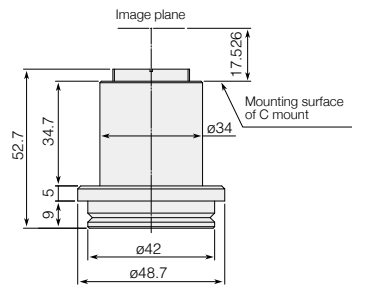
Unit: mm

	CM2-F10	CM2-F175
Magnification	1.0x	1.75x
Camera Mount	F-mount	
Suitable Camera	35 mm Full-Frame (36x24 mm)	
Image Size (Diagonal Length)	25 mm	43.2 mm
EPI-Illumination	Koehler Illumination (Simplified Telecentric Illumination with Adjustable Aperture Stop) Fiber Light Guide Adapter with 8 mm Bore)	
Applicable Objective Lenses (*1)	CFI TU Plan EPI Objective Lens Series (Optical Field Number: 25, Parfocal Distance: 60mm, Thread: M25 x 0.75) High Resolution Objective Lens Series HR5xA (Optical Field Number: 25, Parfocal Distance: 45mm, Thread: M27x0.75)	
Number of Attachable Surface	3 Sides (4-M4 Hole for Attachment Screw)	
Options (*2)	• Manual Nosepiece MR-5 can be Used (Equipped with Dedicated Adapters) • C Mount Adapter (EXA60014) is also available.	

*1: Please ask us for enable/disable objective lenses and magnifications. *2: Please ask us for customized camera mount other than F-Mount and C-Mount

C Mount for CM2-F

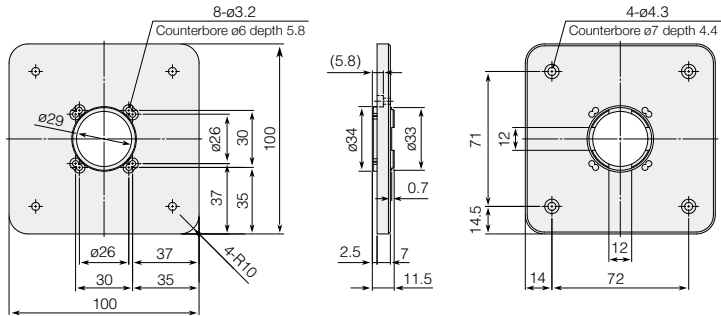
EXA60014



Unit: mm

CM Adapter 2 EXA60023

CM Adapter 2 combines between a CM Microscope and a MR-5 manual nosepiece.

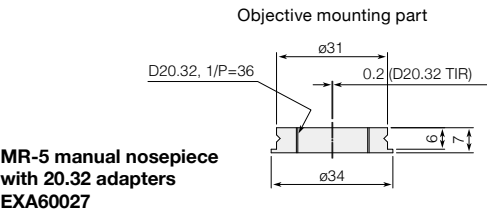
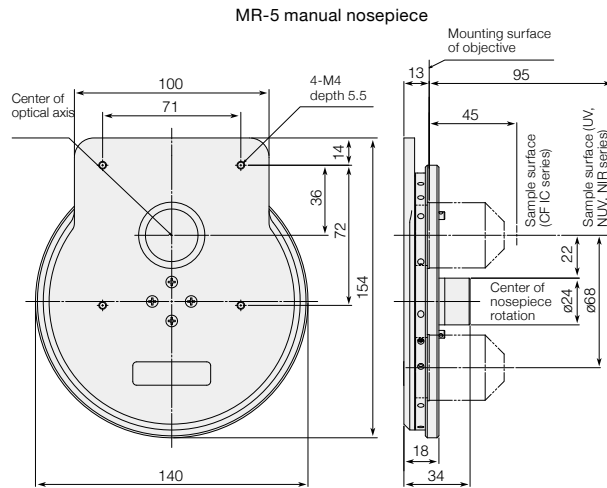


Unit: mm

MR-5 Manual Nosepiece

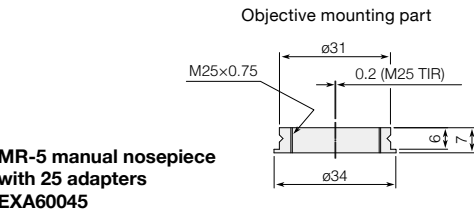
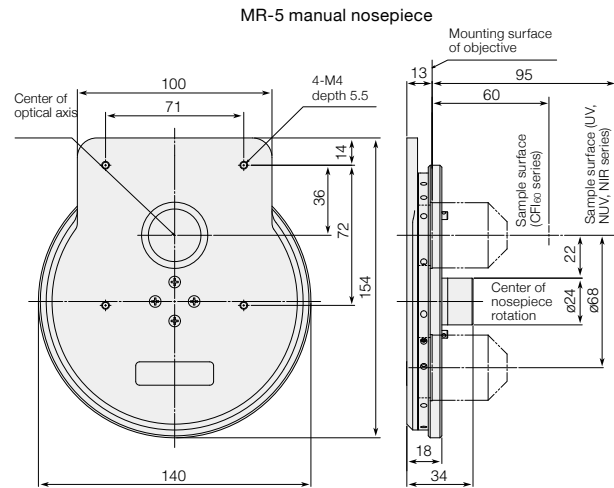
MR-5 manual nosepiece with 20.32 adapters

MR-5 is the manual nosepiece for CM and CM2 micorscopes. This item is compatible with CF&IC EPI objective lenses and CM Adapter 2 will be required to combeine with a CM or a CM2 microscope.



MR-5 manual nosepiece with 25 adapters

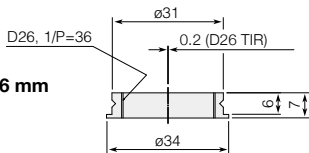
MR-5 is the manual nosepiece for CM and CM2 micorscopes. This item is compatible with CFI60-2 EPI objective lenses and CM Adapter 2 will be required to combeine with a CM or a CM2 microscope.



MR-5 Nosepiece Adapter 26 mm

This item is the adapter of MR-5 manual nosepiece for UV, NUV objective lenses.

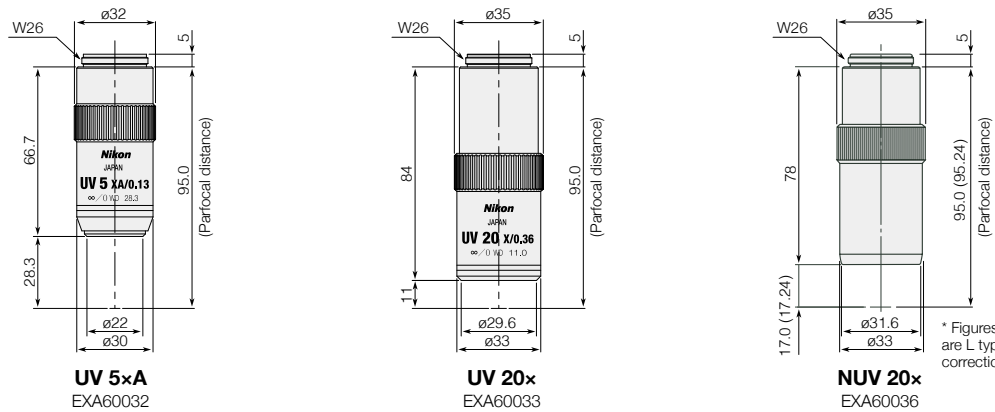
MR-5 Nosepiece Adapter 26 mm EXA60050



Unit: mm

Ultra Violet/Near-ultraviolet Objective lenses

High-precision processing and observation performance, and superior laser durability.



Unit: mm

Magnifications	NA (numerical parfocal distance aperture)	W.D. (mm)	Focal distance (mm)	Resolution* (μm)	Focal depth* (μm)	Actual field of view (mmφ)	Weight (g)	Chromatic aberration correction wavelength (nm)	Parfocal distance (mm)
UV 5xA	0.13	28.3	40.0	2.1	±16.2	5	260	266 nm to C (656.3 nm) continuous correction	95.0
UV 20x	0.36	11.0	10.0	0.76	±2.1	1.25	407	266 nm, 355 nm, 532 nm and e (546.1 nm)	
NUV 20x	0.4	17.0	10.0	0.68	±1.71	1.25	350	55, 532, 486.1(F), 587.6(d), 656.3(C)	

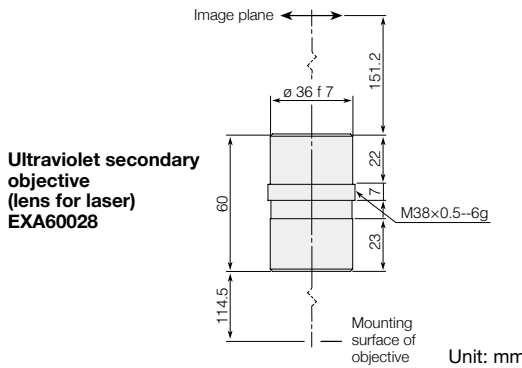
* Resolving power and depth are calculated with a reference wavelength of 546 nm.

Ultraviolet Secondary Objective (Lens for Laser)

Secondary objective lens for use with ultraviolet objective lens UV, near-ultraviolet objective lens NUV, and near-infrared objective lens NIR.

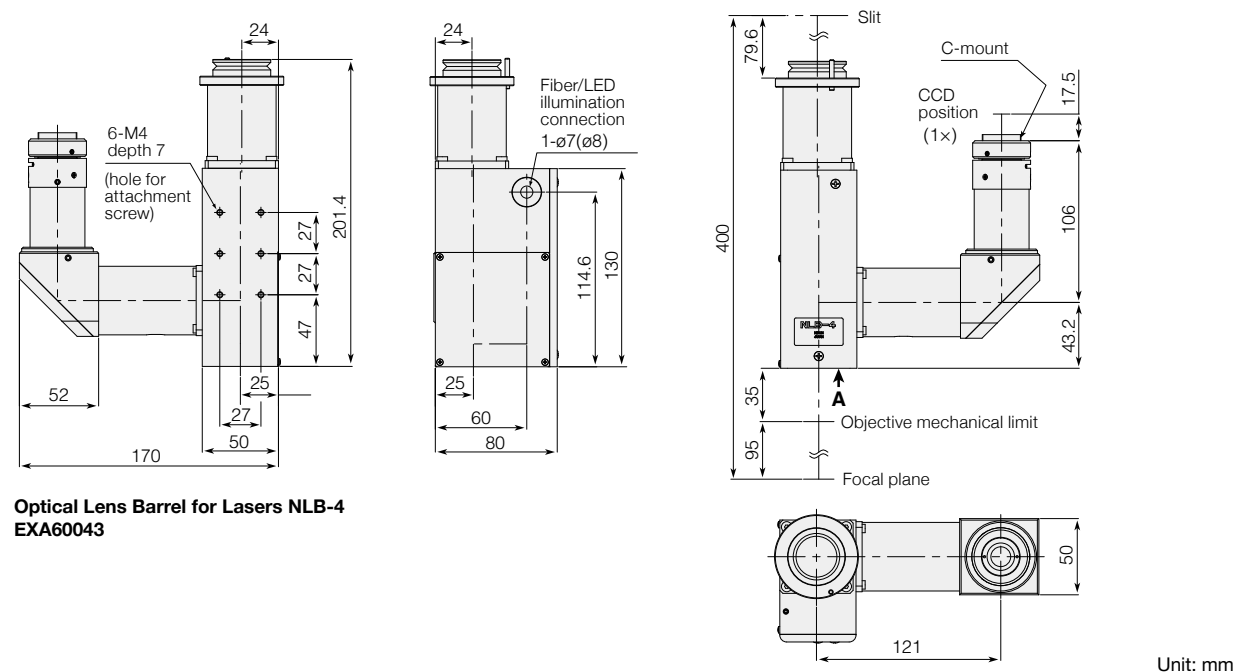
•Use in laser machining systems and as imaging lenses for visible wavelength observation optics.

Focal distance (mm)	Field number (mm)	Chromatic aberration correction wavelength (nm)
200	φ25	266 to 1064 (continuous)



Unit: mm

Optical Lens Barrel for Lasers NLB-4



Name / model		Optical Lens Barrel for Lasers / NLB-4
Lens barrel	Supported lasers	YAG 4 wavelengths (1,064, 532, 355, 266 nm)
	Secondary objective lens	1× (near-infrared, visible, near-ultraviolet, ultraviolet)
Observation area	Observation image	Brightfield / erect image
	Camera port	C Mount
	Imaging magnification	1x
	Supported image sensor	1x: Camera of 2/3 inch or less image sensor (C-mount) (0.5x: Camera of 1/2 inch or less image sensor)
Illumination		Brightfield epi-illumination
Light source		Halogen fiber (Diameter 7 / 8 mm) / LED (Diameter 8 mm)
Supported nosepieces		Manual nosepiece
Supported objective lenses	For observation	CFI60 series*
	For processing	UV/NUV objective lenses, NIR objective lenses and equivalent objective lenses from other manufacturers
Standalone weight		Approximately 1.3kg

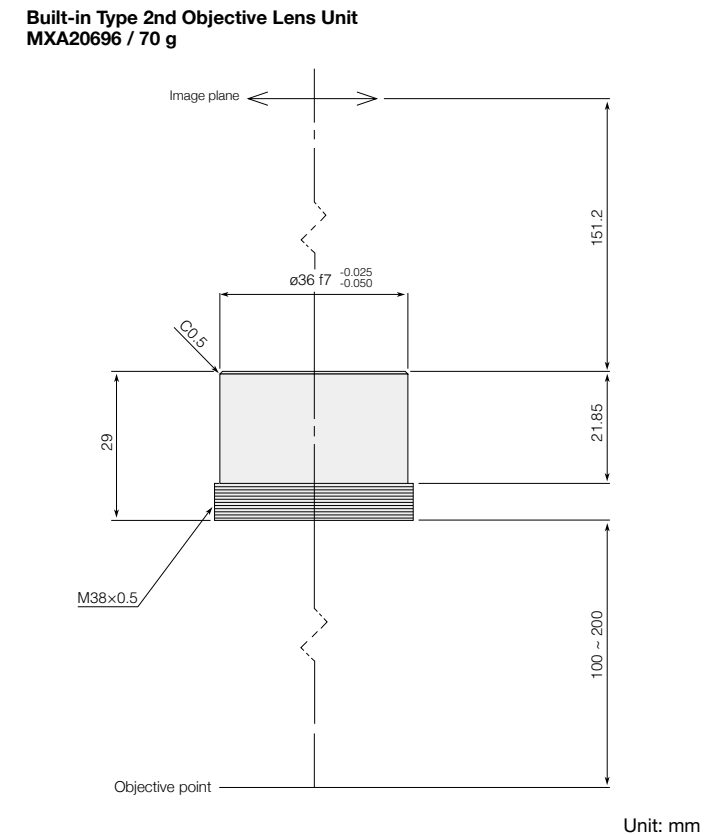
*An adapter is available for adjusting the parfocal distance of the objective lens used for processing.

2nd Objective Lens Units

Used to focus parallel light beams coming through CFI₆₀-2 / CFI₆₀ objectives and CF&IC objectives onto the image plane.

Built-in Type 2nd Objective Lens Unit

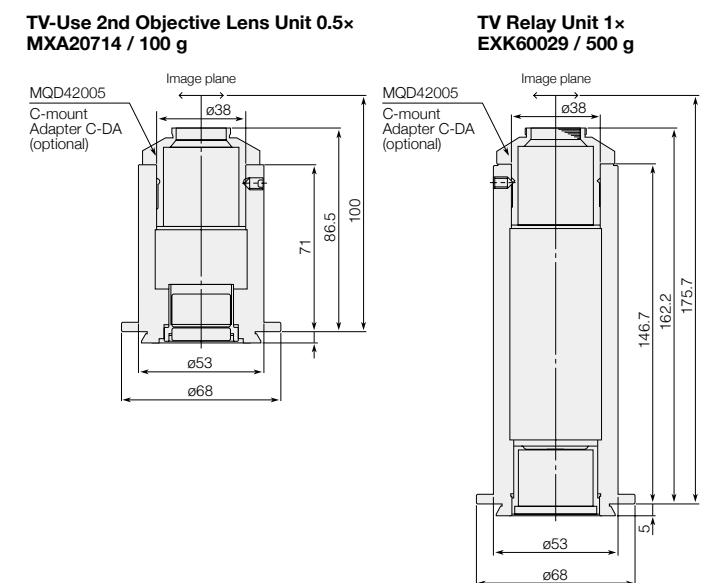
- Compatible with CFI60-2, CFI60 and CF&IC infinity objectives.
- Focal length: f/200 mm.
- To obtain the optimal objective performance, keep the distance between the lens unit and the objective's shoulder within 100-200 mm as shown in the diagram at right.



Unit: mm

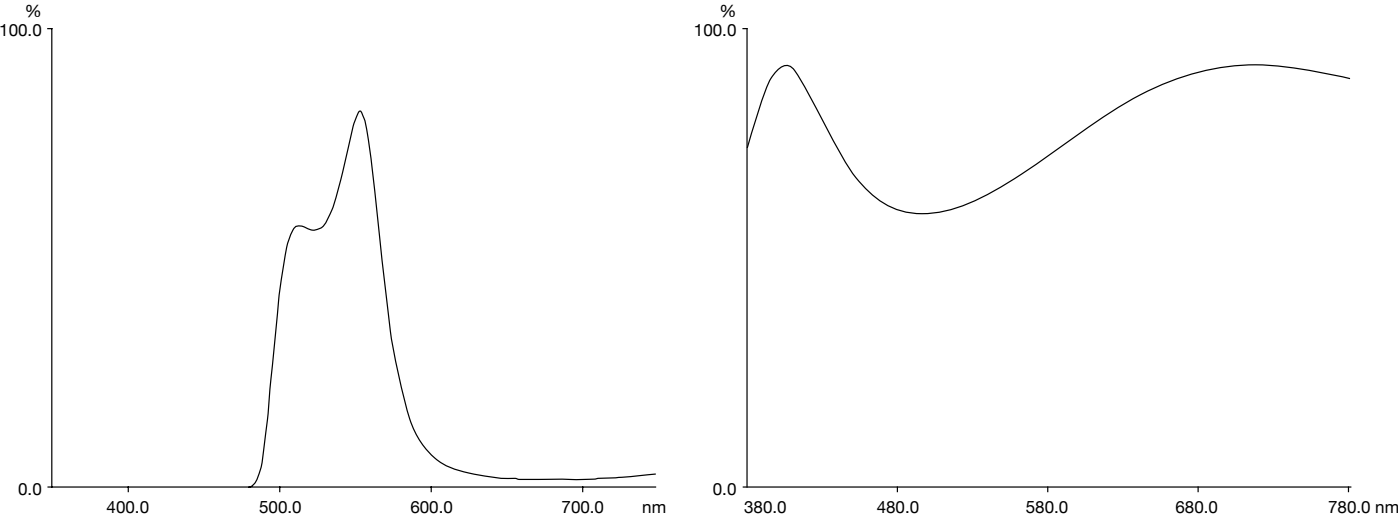
**TV-Use 2nd Objective Lens Unit 0.5x/
TV Relay Unit 1x**

- Image plane magnification: 0.5×; Focal length: f/100 mm.
- Image plane magnification: 1×; Focal length: f/200 mm.
- With a field number of 11 mm. This lens unit (FN11), can be used with cameras smaller than 2/3-inch.
- Distance between the lens unit and the objective's shoulder: 60-160 mm (110 mm optimum).
- Compatible with Universal Epi-Illuminators (LV-UEPI-N, LV-UEPI2, LV-UEPI2A, and LV-EPILED).



Unit: mm

Filters



GIF Filter

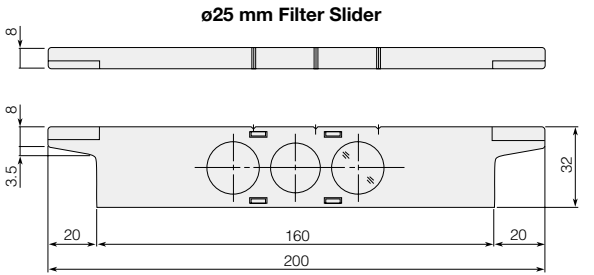
Allows only a green spectrum near the 546 nm wavelength to pass through. Effective for increasing the contrast of monochrome photographs and black-and-white TV images.

LV-C-LCB Filter

Filter adjusts the high coloring rendering for the C-LL-I LED lamphouse.

ND Filters

- ND Filters adjust the brightness during observation and imaging by reducing the amount of light without changing conditions such as the spectral characteristics (color balance) of the illumination.
- Filter size is ø25 and its thickness is 2 mm.



Unit: mm

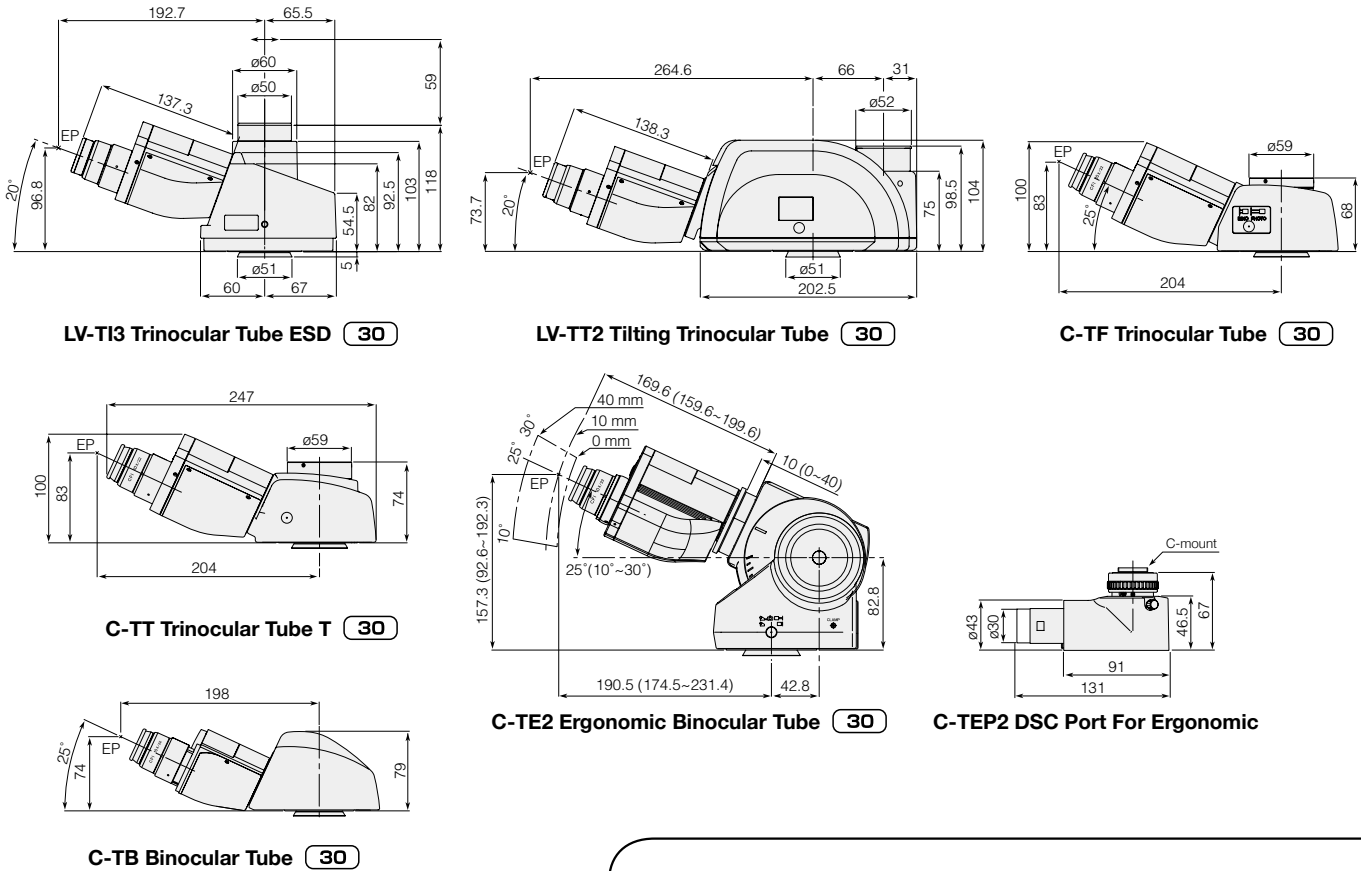
Code No.	Items	Weight (g)
MBE65900	C-LL-I LED Lamphouse	60
MBN66930	YM-GIF ø25 mm GIF Filter	25
MBN66950	LV-C-LCB Color Balance Filter	30
MBN66960	45C-LCB Color Balance Filter	30
MBN66760	YM-ND ø25 mm Filter Slider ND4/ND16	36

Eyepiece Tubes/Double Port/Straight Tubes

Sleeve diameterø (mm) 30

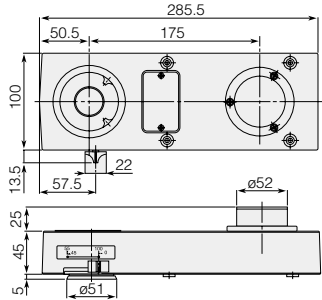
Illuminators LV-UEPI-N LV-UEPI2 LV-UEPI2A LV-EPILED

These lens tubes can be combined with illuminators such as the LV-UEPI, LV-UEPI2, LV-UEPI2A and LV-EPILED. The trinocular eyepiece tube supports both ultrawide and wide fields of view with a change of the eyepiece lens.

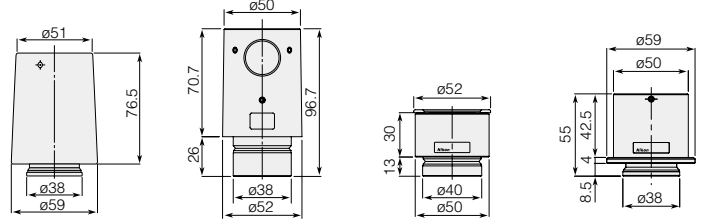


Double Port

Installed between the epi-illuminator and the trinocular tube, the double port enables simultaneous attachment of cameras.



Straight Tubes



Used to change the format of the straight tube of a trinocular tube.

(Unit: mm
EP: Eyepoint)

Code No.	Items	Weight (g)	Type	Image type	Field number	Tube's tilt angle	Beam split ratio (observation:photo)	Interpupillary distance
MBB63425	LV-TI3 Trinocular Tube ESD	1800	Siedentopf	Erect	22/25	20°	100:0/0:100	50~75 mm
MBB61000	LV-TT2 Tilting Trinocular Tube	2580	Siedentopf	Erect	22/25	10°~ 30°	100:0/20:80	50~75 mm
MBB93106	C-TF Trinocular Tube F	1850	Siedentopf	Inverted	22/25	25°	100:0/0:100	50~75 mm
MBB93115	C-TT Trinocular Tube T	2260	Siedentopf	Inverted	22/25	25°	100:0/20:80/0:100	50~75 mm
MBB93800	C-TE2 Ergonomic Binocular Tube	2100	Siedentopf	Inverted	22	10°~ 30°	—	50~75 mm
MBB92106	C-TB Binocular Tube	950	Siedentopf	Inverted	22	25°	—	50~75 mm

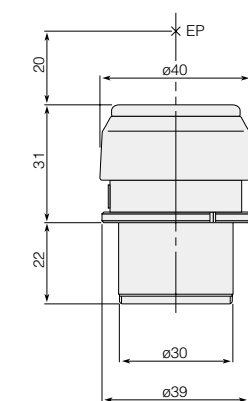
Focal distance of tube in the infinity corrected optics: 200 mm, Equipment magnification:1×, Diameter of the circular dovetail mount to the body: 51 mm.

MBB96800	C-TEP2 DSC Port For Ergonomic	350	Specially for C-TE Binocular Ergonomic Tube, Equipment magnification: 0.7×, Beamsplit ratio (binocular: port) 50:50/100:0					
MBB74100	Y-IDP Double Port	1300	Equipment magnification: 1×, Beamsplit ratio (observation: photo) 55:45/100:0					
MBB74105	Y-IDP Double Port 0/100	1300	Equipment magnification: 1×, Beamsplit ratio (observation: photo) 100:0/0:100					

* For attachment to eyepiece tubes or double port, refer to the system diagram on page 3.
* CFI UW 10× and CFI UW 10×M are not suitable for use.

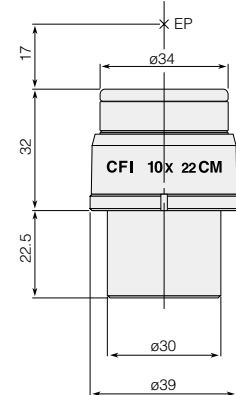
Eyepieces

These eyepieces have a 30 mm sleeve diameter and maximize the performance of objective lenses.



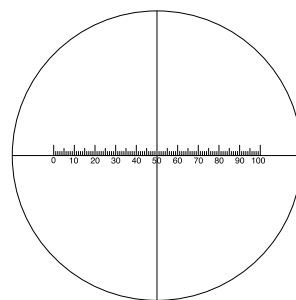
LV-10xESD

30



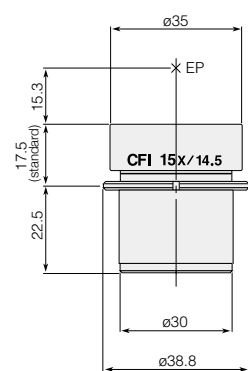
CFI 10xCM

30



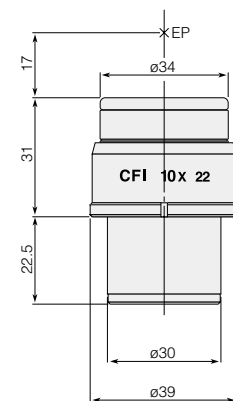
10 mm (in 100 μ m increment)

CFI 10 $\times$ CM eyepiece reticle



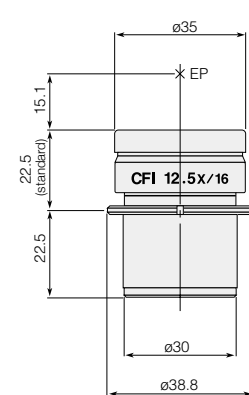
CFI 15x

30



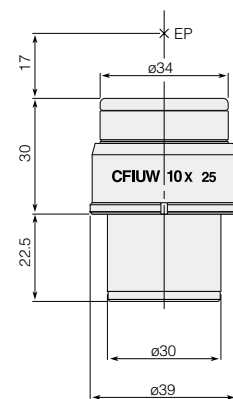
CFI 10x

30



CFI 12.5x

30



CFI UW10x

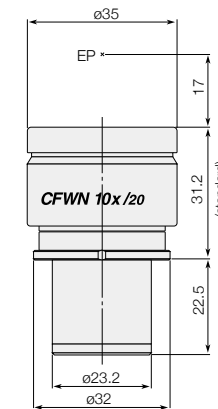
30

(Unit: mm
EP: Eyepoint)

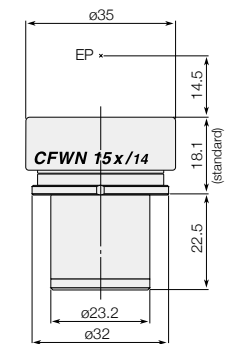
Code No.	Items (field number)	Weight (g)	Code No.	Items (field number)	Weight (g)
MBJ62105	LV-10×ESD (22)	70	MAK10120	CFI 12.5× (16)	63
MAK10100	CFI 10× (22)	75	MAK10150	CFI 15× (14.5)	48
MAK12105	CFI 10×CM (22) with crosshair reticle	77	MAK30105	CFI UW10× (25)	100

Eyepieces

These eyepieces have a 23.2 mm sleeve diameter and maximize the performance of objective lenses.



CFWN 10x
23.2



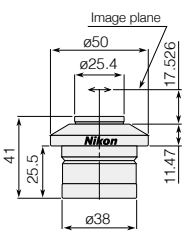
CFWN 15x
23.2

(Unit: mm
EP: Eyepoint)

Code No.	Items (field number)	Weight (g)
MBJ20105	CFWN 10× (20)	50
MBJ20150	CFWN 15× (14)	50

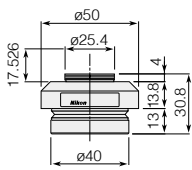
Digital Camera Adapters

C-mount and F mount camera adapters are available.

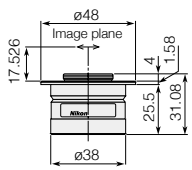


C-mount Adapter C-DA
MQD42005/180g

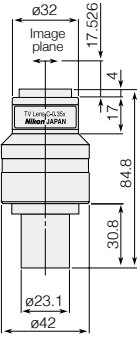
1X Relay Lens is not necessary.



C-mount Adapter 0.55X
MQD42056 / 300 g

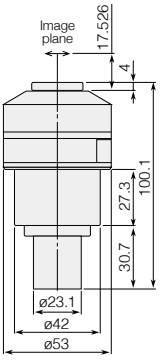


C-mount Adapter 0.7X
MQD42075 / 155 g

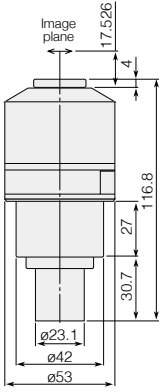


C-mount Adapter 0.35X
MQD51045 / 300 g

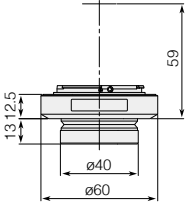
C-mount adapters feature a built-in reduction relay lens, enabling areas equivalent to those seen through the eyepiece to be viewed on the monitor.



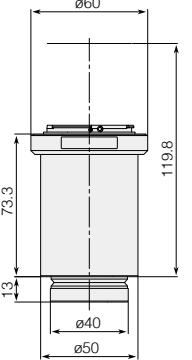
C-mount Adapter 0.45X
MQD42045 / 620 g



C-mount Adapter 0.6X
MQD42066 / 650g



F-mount Adapter
MQD43000 / 165 g

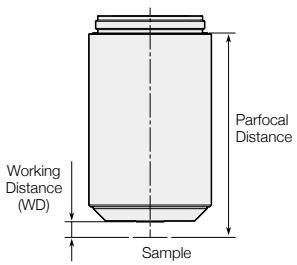


F-mount Adapter 2.5X
MQD43020 / 165 g

Glossary

Working Distance (WD) and Parfocal Distance

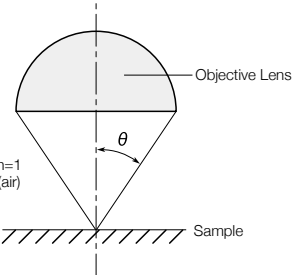
Working distance is the distance between the top lens of the objective and the surface of the sample (or the cover glass) when in focus. The distance between the objective's shoulder and the sample (or the cover glass) when in focus is referred to as parfocal distance. Nikon's CF infinity objectives have a parfocal distance of 45 mm, while the CF160-2 / CF160 objectives feature a parfocal distance of 60 mm.



Numerical aperture (NA)

Numerical aperture is generally indicated by the equation below.

Where, $NA = n \times \sin \theta$
 n = Refractivity of the substance existing between the sample and the objective. (n=1 for air)
 $\sin \theta$ = Angle that is formed by the optical axis and the light ray that passes to the extreme periphery of the objective lens.



Numerical aperture is the most important factor in judging the objective's resolving power, brightness, and depth of focus.

Resolving Power

The closest proximity of two objects that can be seen as two distinct regions of the image. Resolving power is generally indicated by the equation below, where the larger the NA the greater the resolving power.

Resolving Power = $0.61 \times \frac{\lambda}{NA}$
 Where,
 λ = Light source's wavelength (generally 0.55 μ m)
 NA = Numerical aperture of objective

Depth of Focus (When observing with eyepieces)

The range in front of and behind the target plane of the sample, within which the observed structure can be sharply focused. The accommodation power of the human eye varies from person to person, so does depth of focus. Depth of focus is indicated by the equation below.

Depth of focus = $\frac{n \times \lambda}{2 \times (NA)^2} + \frac{n}{7 \times NA \times M} \times 1000$
 λ = Light source's wavelength (generally 0.55 μ m)
 NA = Numerical aperture of objective
 M = Total magnification
 n = Refractivity of the substance existing between the sample and the objective. (n=1 for air)

Pupil Diameter

The pupil diameter of the objective lens is expressed by the following equation:

f = Focal distance of objective lens
 NA = Numerical aperture of objective

Refer to this brochure for the values of f and NA for each objective lens. In addition.

Total Magnification

Observation magnification = Objective lens magnification $\times$ Eyepiece magnification

Field of View (FOV)

Field of View (FOV) = Eyepiece FOV $\div$ Objective lens magnification

Camera Size

Sensor Size	Diagonal Length	Length	Width
Full size	43.0 mm	35.8 mm	23.8 mm
1 inch	15.9 mm	12.9 mm	8.76 mm
1/1.8 inch	8.5 mm	6.91 mm	4.92 mm
1/2.8 inch	6.4 mm	5.57 mm	3.13 mm

Unit: mm

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*Products: Hardware and its technical information (including software)



WARNING

TO ENSURE CORRECT USAGE, READ THE CORRESPONDING MANUALS CAREFULLY BEFORE USING THE EQUIPMENT.



NIKON CORPORATION

1-5-20, Nishioi, Shinagawa-ku, Tokyo 140-8601, Japan
Tel: +81 3 6743 5742
<https://industry.nikon.com/>

ISO 14001 Certified
for NIKON CORPORATION

ISO 9001 Certified
for NIKON CORPORATION
Industrial Solutions Business Unit

NIKON METROLOGY EUROPE NV

Interleuvenlaan 86, 3001 Leuven, Belgium
Tel: +32 16 74 01 01
Sales.NM@nikon.com

NIKON METROLOGY UK LTD.

UNITED KINGDOM Tel: +44 1332 811 349
Sales.UK.NM@nikon.com

NIKON METROLOGY SARL

FRANCE Tel: +33 1-60 86 09 76
Sales.France.NM@nikon.com

NIKON METROLOGY GMBH

GERMANY Tel: +49 211 4544 6951
Sales.Germany.NM@nikon.com

NIKON METROLOGY, LLC

12701 Grand River Road, Brighton, MI 48116 U.S.A.
Tel: +1 810 220 4360
Sales.NM-US@nikon.com

NIKON METROLOGY - MEXICO

Sales.NM-US@nikon.com

NIKON PRECISION (SHANGHAI) CO., LTD.

CHINA Tel: +86 21 6841 2050 (Shanghai)
CHINA Tel: +86 10 5831 2028 (Beijing branch)
CHINA Tel: +86 20 3882 0551 (Guangzhou branch)
Web.Nis@nikon.com

NIKON INSTRUMENTS KOREA CO., LTD.

KOREA Tel: +82 2 6288 1900
NIK.Sales@nikon.com

NIKON SINGAPORE PTE LTD.

SINGAPORE Tel: +65 6559 3651
NSG.Industrial-sales@nikon.com

PT. NIKON INDONESIA

INDONESIA Tel: +62 213 873 5005
PTN.Instruments@nikon.com

NIKON SALES (THAILAND) CO., LTD.

THAILAND Tel: +66 2633 5100
NST.Inst@nikon.com

IM-MC2512EN

En